THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES

FOR APRIL 1883.

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Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of May.

Liberal compensation is made for all articles used. Extra copies, in pamphlet form with cover, will be furnished to authors in lieu of compensation, *provided the request for them be made at the time the communication is sent* to the Editor.

The following works have been received for review:—

General Pathological Anatomy. By ERNST ZIEGLER, Prof. of Path. Anat. in the University of Tübingen. Translated, with notes, by Donald MacAlister, M.B., M.D. Part I. London: MacMillan & Co., 1883.

Nerve Vibration and Excitation. By J. MORTIMER GRANVILLE, M.D. London: J. & A. Churchill, 1883.

The Relative Mortality after Amputations in Large and Small Hospitals. By HENRY C. BURDETT, Fell. of Statistical Society. London: J. & A. Churchill, 1882.

Medical Education: Introductory Address in Universities of Glasgow and Edinburgh. By W. T. GAIRDNER, M.D., Professor of Medicine in the University of Glasgow. Glasgow, 1883.

Students' Hand-Book of Forensic Medicine and Medical Police. By H. AUBREY HUSBAND, M.B., C.M. Edinburgh: E. & S. Livingstone. 1883.

A Case of Lithotomy. By REGINALD HARRISON, F.R.C.S. London, 1882.

Two New Methods of Reduction of Dislocations of the Femur and Humerus. By JAMES E. KELLY, F.R.C.S.I., M.R.I.A. Dublin, 1882.

The Laws of Life and their Relation to Diseases of the Skin. By J. S. MILTON, Lecturer at St. John's Hospital for Dis. of Skin. London: Chatto & Windus, 1882.

Deafness in Hysterical Hemianæsthesia. By G. L. WALTON, M.D.

Treatment of Acute Rheumatism. By ISAMBARD OWEN, M.D. London: J. & A. Churchill, 1883.

Basic Cavities. By J. MITCHELL BRUCE, M.D. London, 1883.

Lumbar Colectomy. By THOS. BRYANT, F.R.C.S. London, 1883.

The Treatment of the Gunshot Wounds of the Abdomen. By J. MARION SIMS, M.D., LL.D. London, 1882.

St. Thomas's Hospital Reports. Vol. XI. London: J. & A. Churchill, 1882.

Proceedings of the N. W. Provinces and Oudh Branch of the British Medical Association. Allahabad, Nov., Dec. 1882.

Chromatoptometrical Table. By OLE BULL, M.D. Christiania, 1882.

La Trichine et la Trichinose. Par JOHANNES CHATIN. Paris: J. & B. Baillière et Fils, 1883.

Des Inoculations Préventives dans les Maladies Virulentes. Par le Dr. E. MASSE, Prof. à la Faculté de Médecine de Bordeaux. Paris: G. Masson, 1883.

Rapport sur le Programme du Concours sur la Prévention de la Cécité. Par le Dr. G. HALTENHOFF. Genève, 1882.

Relazione Sanitaria la Amministrativa per l'anno 1881. Torino, 1882.

Primo Caso di Estirpazione totale dell' utero eseguito in Italia col processo di Bardenhauer. Torino, 1882.

Dell' Anemia Splenica del Dott. G. BANTI. Firenze, 1882.

Das Naphtalin in der Heilkunde und in der Landwirthschaft, mit besonderer Rücksicht auf seine Verwendung zur vertilgung der Reblaus. Von Dr. Med. ERNST FISCHER, Privatdocent der Chirurgie in der Kaiser-Wilhelms-Universität Strassburg. Strassburg: Karl J. Trubner, 1883.

Zur Frage der Behandlung der Uterus-Carcinome. Von Dr. KARL PAWLIK. Wien, 1882.

Lymphangiectasie mit Lymphorrhagie. Von P. ZUR NIEDEN. Berlin, 1882.

Ueber die tetanische Erregung von Froschnerven durch der constanten Strom. Von M. VON FREY. Leipzig, 1882.

Ueber Laparomyotomie. Von Prof. HEINRICH FRITSCH. Breslau, 1883.

A Guide to Therapeutics and Materia Medica. By ROBERT FARQUHARSON, M.D. Edited by Frank Woodbury, M.D. Third edition. Philadelphia: Henry C. Lea's Son & Co., 1882.

A System of Human Anatomy. By HARRISON ALLEN, M.D., Prof. of Physiology in Univ. of Penna. Part 3. Muscles and Fasciæ. Philadelphia: Henry C. Lea's Son & Co., 1882.

Diseases of the Ear. By ADAM POLITZER, M.D., Imperial Royal Professor of Aural Therapeutics in the University of Vienna. Translated and edited by James Patterson Cassells, M.D., Lecturer on Aural Surgery at the Glasgow Hospital. Philadelphia: Henry C. Lea's Son & Co., 1883.

Early Aid in Injuries and Accidents. By FRIEDRICH ESMARCH, M.D., Professor of Surgery at the University of Kiel. Translated by H. R. H. Princess Christian. Philadelphia: Henry C. Lea's Son & Co., 1883.

Scrofula and its Gland Diseases. By FREDERICK TREVES, F.R.C.S. Philadelphia: Henry C. Lea's Son & Co., 1883.

Diseases of the Skin. By JAMES NEVINS HYDE, A.M., M.D., Professor of Skin and Venereal Diseases, Rush Medical College, Chicago. Philadelphia: Henry C. Lea's Son & Co., 1883.

Experimental Pharmacology: A Hand-book of Methods for Studying the Physiological Action of Drugs. By L. HERMANN, Prof. of Physiology in Zürich. Translated, with additions, by Robt. Meade Smith, M.D., Demonstrator of Physiology in University of Pennsylvania. Philadelphia: Henry C. Lea's Son & Co., 1883.

Nerve Prostration and Hysteria. By W. S. PLAYFAIR, M.D., F.R.C.P. Philadelphia: Henry C. Lea's Son & Co., 1883.

Practical Examination of Urine. By JAMES TYSON, M.D., Prof. of Pathology in the University of Pennsylvania. Philadelphia: P. Blakiston, Son & Co., 1883.

Quiz Compends: Physiology. By A. P. BRUBAKER, M.D., Demonstrator of Physiology in Jefferson Medical College. Philadelphia: P. Blakiston, Son & Co., 1883.

Injuries of the Spine and Spinal Cord. By HERBERT W. PAGE, M.A., M.C. Philadelphia: P. Blakiston, Son & Co., 1883.

Vision: its Optical Defects. By C. S. FENNER, M.D. Second edition. Philadelphia: P. Blakiston, Son & Co., 1883.

Dictionary of Medicine. By various writers. Edited by RICHARD QUAIN, M.D., F.R.S. New York: D. Appleton & Co., 1883.

A Manual of Histology. Edited and prepared by THOS. E. SATTERTHWAITE, M.D. Second edition. New York: Wm. Wood & Co., 1882.

Legal Medicine. By CHAS. MEYMOTT TIDY, M.B., F.C.S. Vols. I. and II. New York: Wm. Wood & Co., 1883.

Manual of Gynæcology. By D. BERRY HART, M.D., Lecturer on Midwifery and Diseases of Women, School of Medicine, Edinburgh, and A. H. BARBOUR, M.B., Assistant to the Professor of Midwifery in University of Edinburgh. Vol. I. New York: Wm. Wood & Co., 1883.

Quain's Anatomy. By A. THOMSON, M.D., Mr. E. A. SCHÄFER, Mr. G. D. THANE. Two vols. Ninth edition. New York: Wm. Wood & Co., 1882.

Hand-book of Vertebrate Dissection. Part II. How to Dissect a Bird. By H. NEWELL MARTIN, M.D., Prof. in the Johns Hopkins University, and WM. A. MOALE, M.D. New York: MacMillan & Co., 1883.

The Hospital Treatment of Diseases of the Heart and Lungs. By C. H. GOODWIN, M.D. New York, 1883.

Hygienic Measures for Chronic Catarrhal Inflammation of the Nose, Throat, and Ears. Second edition. By THOS. F. RUMBOLD, M.D. St. Louis, 1882.

Pocket Therapeutics and Dose-Book. By MORSE STEWART, M.D. Third edition. Detroit: Geo. D. Stewart, 1882.

The Compend of Anatomy. By JOHN B. ROBERTS, A.M., M.D. Third edition. Philadelphia: C. C. Roberts & Co., 1883.

The Disposal of the Dead. By W. H. CURTIS, M.D., of Chicago, Ill. 1882.

The Crustacea of the Fresh Waters of Minnesota. By C. L. HERRICK. 1882.

Addresses delivered at the Dedication of Cooper Medical College Building, San Francisco, 1882.

Addresses in Surgery. By WM. A. BYRD, M.D. Quincy, Ill., 1882.

A Large Fibro-Cyst of the Uterus and Ovarian Cystoma coexisting with Pregnancy: Operation; Recovery. By WALTER COLES, M.D. St. Louis, 1882.

The Untoward Effects of Drugs. By L. LEWIN, M.D. Translated by J. J. MULHERON, M.D. Second edition. Detroit: Geo. S. Davis, 1883.

A Manual of Chemical Analysis as applied to the Examination of Medicinal Chemicals. Third edition, thoroughly revised and greatly enlarged. By FREDERICK HOFFMANN, A.M., Ph.D., Public Analyst of the State of New York, and FREDERICK B. POWER, Ph.D., Prof. of Analytical Chemistry in the Philadelphia College of Pharmacy. Philadelphia: Henry C. Lea's Son & Co., 1883.

Bromide of Ethyl as an Anæsthetic. By J. J. CHISOLM, M.D. Baltimore, 1883.

Primary Antiseptic Occlusion in Military Practice. By H. I. RAYMOND, M.D., U.S.A. New York, 1882.

The Value of Graduated Pressure in Disease of the Uterine Appendages. By NATHAN BOZEMAN, M.D. New York, 1883.

Annual Address before the American Academy of Medicine. By TRAILL GREEN, M.D. Philadelphia, 1882.

The Prevention of Insanity. By NATHAN ALLEN, M.D. Boston, 1883.

Herbert Spencer on American Nervousness. By GEORGE M. BEARD, M.D. New York, 1883.

The Treatment of Acute Eczema. By GEORGE H. ROHÉ, M.D. Baltimore, 1883.

The Placental Development in Mammals. By HENRY O. MARCY, M.D. Boston.

The Management of Chronic Inebriates. By A. N. BLODGETT, M.D. Boston, 1882.

The Moral Significance of Sterility. By H. R. BIGELOW, M.D. Washington, D. C., 1883.

The Rights of the Insane. By C. H. HUGHES, M.D.

Experience of an Opium-Eater during the withdrawal of the Drug. By C. H. HUGHES, M.D.

Therapeutic Value of Cephalic and Spinal Electrizations. By C. H. HUGHES, M.D. St. Louis, 1883.

Massage. By DOUGLAS GRAHAM, M.D. Boston, Mass., 1882.

Illinois State Board of Health, Preventive Disease Circulars—Diphtheria, Scarlet Fever, Typhoid Fever.

Methods of Treating Operative Wounds. By H. O. MARCY, M.D. Boston, 1882.

Dynamics of Sanitary Science. By E. R. EGGLESTON, M.D. Mt. Vernon, 1883.

Parasites in the Blood of the Frog. By WM. OSLER, M.D.

Canadian Fresh-water Polyzoa. By WM. OSLER, M.D.

Parasites of the Pork-supply of Montreal. By WM. OSLER, M.D. Montreal, 1883.

Sudden Death by the Entrance of Air into the Veins. By F. W. DRAPER, M.D. Boston, 1883.

The Relation between Diphtheria and Scarlet Fever. By A. HURD, M.D. 1883.

The Percentage of College-bred Men in the Medical Profession. By CHAS. McINTIRE, M.D., of Easton. 1882.

The Connection of the Lower Organisms with Infectious Diseases. By W. T. COUNCILMAN, M.D. Baltimore, 1883.

Tuberculosis as an Infectious Disease. By W. T. COUNCILMAN, M.D. Baltimore, 1882.

Modified Listerism in Ovariotomy. By E. F. JENKS, M.D. Chicago, Ill., 1883.

Bacteria and their Presence in Syphilitic Secretions. By R. B. MORISON, M.D. Baltimore, 1883.

Is Gonorrhœa a Bacteria Disease? By N. A. S. KEYSER. Baltimore, 1883.

A Study of the Malformations of the Circulatory Apparatus in Man. By RANDOLPH WINSLOW, M.D. Baltimore, 1883.

Nephrotomy for Hydronephrosis. By A. T. CABOT, M.D. Boston, 1883

Transactions of the Lancaster City and County Medical Society. Oct. 1882.

Transactions of the Medical Association of the State of Missouri for 1882.

Transactions of the Minnesota State Medical Society. St. Paul, 1882.

Transactions of the Medical Society of the State of Tennessee. 1882.

Transactions of the American Ophthalmological Society. 1882.

Transactions of the State Medical Society of Pennsylvania. 1882.

Proceedings of Medical Society of County of Kings. Jan., Feb., March, 1883.

Proceedings of the American Philosophical Society. Vol. XX. No. 112. 1883.

Proceedings of North Carolina Board of Health and State Medical Society. 1882.

Proceedings of the Naval Medical Society. Vol. I. No. 1. Washington, 1883.

Report of the State Board of Health of California for 1881. Sacramento, 1882.

Report of the Connecticut State Board of Health for 1882.

Report of the State Board of Health of Illinois for 1882.

The following Journals have been received in exchange:—

Bibliothek für Læger, Bd. xii. Nos. 2, 3, 4, xiii. No. 1.

Nordiskt Medicinskt Arkiv, Bd. xiv. Häft. 3, 4.

Upsala Läkareförenings Förhandlingar, Bd. xviii. Nos. 1, 2.

Kronika Lekarska, Nos. 18 to 24, 1882, 1 to 4, 1883.

Annali Universali di Medicina e Chirurgia, Aug. 1882, to Jan. 1883.

Gazzetta degli Ospitali, Nos. 74–97, 1882, 1–18, 1883.

Gazzetta Medica di Torino, Nos. 26–36, 1882, 1–6, 1883.

Giornale Italiano delle Malattie veneree e della Pelle, Oct.–Dec. 1882.

L'Imparziale, 17–24, 1882, 1–4, 1883.

Lo Sperimentale, Sett. 1882, to Febb. 1883.

Gazette Médicale d'Orient, 1–10, 1882.

O Correio Medico de Lisboa, 16–19, 1882.

Cronica Medico-Quirurgica de la Habana, Ajosto, 1882, to Feb. 1883.

União Medica, Rio de Janeiro, Nos. 11, 12, 1882, 1, 1883.
La Union Medico, Caracas, Nos. 37–48, 1882, 1, 2, 1883.
Boletin de Ciencias Medicas, 5–10, 1882.
Allgemeine Wiener Medizinische Zeitung, Nos. 37–52, 1882, 1–9, 1883.
Berliner Klinische Wochenschrift, Nos. 38–52, 1882, 1–10, 1883.
Centralblatt für Chirurgie, 1–8, 1883.
Centralblatt für die medicinischen Wissenschaften, Nos. 36–52, 1882, 1–8, 1883.
Centralblatt für Gynäkologie, 1–9, 1883.
Centralblatt für klinische medicin, 1–9, 1883.
Deutsches Archiv für Klinische Medicin, Nov., Dec. 1882, Feb. 1883.
Deutsche Medicinische Wochenschrift, Nos. 39–53, 1882, 1–9, 1883.
Medizinische Jahrbücher, Heft 2, 3, 4. 1882.
Wiener Medizinische Presse, Nos. 37–53, 1882, 1–8, 1883.
Zeitschrift für physiologische Chemie, Bd. vi., Bd. vii., Heft 1, 2, 3.
Annales de Dermatologie et de Syphiligraphie, Oct. 1882, to Feb. 1883.
Annales de Gynécologie, Oct. 1882, to Feb. 1883.
Annales des Maladies de l'Oreille, du Larynx, et des Organes Annexes, 5, 6, 1882.
Archives de Neurologie, Nos. 8–13, 1882–3.
Archives Générales de Médecine, Oct. 1882, to Mar. 1883.
Bulletin Générale de Thérapeutique, Sept. 1882, to Feb. 1883.
Gazette Hebdomadaire, 37–52, 1882, 1–9, 1883.
Gazette Médicale de Nantes, 1–4, 1883.
Gazette Médicale de Paris, Nos. 37, 1882, to 9, 1883.
Journal de Médecine de Paris, Nos. 9, 1882, to 9, 1883.
L'Abeille Médicale, Nos. 37, 1882, to 10, 1883.
L'Encéphale, Nos. 1–4, 1882, 1, 2, 1883.
Le Progrès Médicale, Nos. 36, 1882, to 9, 1883.
L'Union Médicale, Nos. 124–179, 1882, 1–31, 1883.
Revue de Chirurgie, Sept. to Dec. 1882, Jan., Feb. 1883.
Revue de Médecine, Sept. 1882, to Feb. 1883.
Revue de Thérapeutique, Nos. 18–24, 1882, 1–5, 1883.
Revue des Sciences Médicales, Oct. 1882, Jan. 1883.
Revue Internationale des Sciences Biologiques, Sept. 1882, to Feb. 1883.
Revue Mensuelle de Laryngologie, etc., Nos. 10–12, 1882, 1–3, 1883.
Revue Scientifique, Nos. 12–27, 1882, 1–9, 1883.
Union Médicale et Scientifique du Nord-Est, Sept. 1882, to Feb. 1883.
Brain, Jan. 1883.
Braithwaite's Retrospect, July-Dec. 1882.
British Medical Journal, Jan. to March, 1883.
Dublin Journal of Medical Sciences, Nov. 1882, to Jan. 1883.
Edinburgh Medical Journal, Jan. to March, 1883.
Glasgow Medical Journal, Jan. to March, 1883.
Journal of Anatomy and Physiology, Jan. 1883.
Journal of Physiology, Vol. IV., No. 1.
Journal of Psychological Medicine, Vol. VIII., Pt. 2.
Lancet, Jan. to March, 1883.
Liverpool Medico-Chirurgical Journal, Jan. 1883.
London Medical Record, Jan. to March, 1883.
Medical Times and Gazette, Jan. to March, 1883.
Ophthalmic Review, Jan. to March, 1883.
Practitioner, Jan. to March, 1883.
Indian Medical Gazette, Nov. 1882, to Feb. 1883.

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On sending address to Dr. Collins, 106 East 35th Street, New York City, blanks, etc., will be supplied.

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"The Chamberlens and the Midwifery Forceps, Memorials of the Family and an Essay on the Invention of the Instrument," by J. H. Aveling, M.D., F.S.A. 8vo. pp. 230. London: J. & A. Churchill, 1882 . . 483

XVI. Guy's Hospital Reports. Edited by H. G. Howse, M.D., and Frederick Taylor, M.D. Third Series, Vol. XXV. 8vo. pp. xviii., 531. London: J. & A. Churchill, 1881 494

XVII. Diseases of the Rectum and Anus. By Charles B. Kelsey, M.D., Surgeon to St. Paul's Infirmary for Diseases of the Rectum, etc. New York: William Wood & Company, 1882. 8vo. pp. xii., 299. Illustrated 506

XVIII. De la Dilatation de l'Estomac. Par le Dr. H. Thiébaut, Chef de Clinique à la Faculté de Médecine de Nancy, Ancien Interne des Hôpitaux, Laureat de la Faculté. Avec deux planches. Paris: J. B. Baillière et Fils.

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XIX. Transactions of the American Ophthalmological Society. Eighteenth Annual Meeting. 8vo. pp. 442. New York: 1882 514

XX. Chapters in the History of the Insane of the British Isles. By Daniel Hack Tuke, M.D., F.R.C.P., President of the Medico-Psychological Association, etc. 8vo. pp. 548. London, 1882 518

XXI. The International Encyclopædia of Surgery: a Systematic Treatise on the Theory and Practice of Surgery, by Authors of various nations. Edited by John Ashhurst, Jr., M.D. Vol. II. New York: William Wood & Co., 1882 523

XXII. The Physiology and Pathology of the Blood: comprising the Origin, Mode of Development, Pathological and Post-mortem Changes of its Morphological Elements in Mammals and Oviparous Vertebrates. By Richard Norris, M.D., F.R.S.E., Professor of Physiology, Queen's College, Birmingham; Vice-President of the Birmingham Philosophical Society. With microphotographic illustrations. 8vo. pp. xiv., 274. London: Smith, Elder & Co., 1882.

Dr. Norris's Third Corpuscle of the Blood. A Criticism and Refutation. By Mrs. Ernest Hart. Pamphlet, 12mo. pp. 12. Reprinted from the London Medical Record of October 15, 1882 530

XXIII. A Dictionary of Medicine, including General Pathology, General Therapeutics, Hygiene, and the Diseases peculiar to Women and Children. By various writers. Edited by Richard Quain, M.D., F.R.S. 8vo. pp. 1816. New York: D. Appleton & Co., 1883 535

XXIV. Manual of Gynecology. By D. Berry Hart, M.D., F.R.C.P.E., Lecturer on Midwifery and Diseases of Women, School of Medicine, Edinburgh, etc., and A. H. Barbour, M.A., B.Sc., M.B., Assistant to the Professor of Midwifery, University of Edinburgh, etc., with 9 lithographs and 400 wood-cuts. 8vo. pp. 644. Maclachlan & Stewart, Edinburgh, 1882 537

XXV. Minute Anatomy of the Central Nervous System of certain Reptiles and Batrachians of America. Illustrated by permanent photo-micrographs. By John J. Mason, M.D. Series A. Newport, 1882. Large 4to. pp. 24, pl. cxiii. Author's edition 538

XXVI. Transactions of the American Otological Society. Fifteenth Annual Meeting. 8vo. pp. 73. Boston: A. Williams & Co., 1882 . . 539

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XXXII. Health Reports.

1. Fourth Annual Report of the State Board of Health of Illinois. 8vo. pp. 245. Springfield, 1882.
2. Seventh Report of the State Board of Health of California. 8vo. pp. 128. Sacramento, 1882 555

XXXIII. A Supplementary Catalogue of the Pathological Museum of St. George's Hospital: A Description of the Specimens added during the Years 1866–1881. By Isambard Owen, M.D., Curator. 8vo. pp. xxxiv., 284. London: J. & A. Churchill, 1882 557

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XXXVI. A Guide to the Practical Examination of Urine. By James Tyson, M.D., Prof. of General Pathology and Morbid Anatomy, University of Philadelphia, etc. etc. Fourth edition, revised and corrected. Philadelphia: P. Blakiston, Son & Co., 1883 560

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FOR APRIL 1883.

Article I.

Experiments to determine the Germicide Value of certain Therapeutic Agents. By Geo. M. Sternberg, M.D., Major and Surgeon, U. S. A.

The objects which the writer has had in view in pursuing the experimental inquiry, the results of which are recorded in the present paper have been:—

(A.) To ascertain the exact value *as germicides* of some of the agents most frequently employed in medical and surgical practice, with a view to the destruction of pathogenic micro-organisms, hypothetical or demonstrated.

(B.) To compare this value, established by laboratory experiments, with the results of clinical experience, for the purpose of ascertaining what support, if any, the germ theory of disease receives from modern therapeutics.

Evidently this support will be strong if it can be shown that the most potent germicides are the very agents which have been found—empirically or otherwise—to be the most effectual for the cure of the diseases which are supposed to be "germ diseases." Unfortunately, no specifics have yet been discovered for a majority of these diseases—and the therapeutic data for comparison are so limited that we cannot hope, at present, to arrive at any definite conclusion.

It is believed, however, that the comparison will not be without value; and that the experimental data recorded may prove useful as a foundation for further therapeutical experiments, and also as a guide in practical sanitation.

Assuming that the infecting agent in infective material is a living micro-organism, or "germ," disinfection will be accomplished by those chemical agents, only, which have the power of destroying the vitality of this organism; and we require to know:—

(*a*) *What* is *the absolute germicide power* of *various disinfecting agents?*—in order to select the best with a view to economy and efficiency:

(*b*) *Are all disease-germs destroyed by these agents in the same proportion?* And if not:

(*c*) *What agents are the most available* for *special kinds* of *infective material?*

In therapeutics we should know in addition to this:—

(*d*) *What is* the *minimum quantity of each of these agents which will restrict the multiplication of each specific disease germ in a suitable culture medium?* This, with reference to medication, with a view to accomplishing a like result within the body of an infected individual.

Evidently anything like a complete answer to these questions is quite impossible in the present state of knowledge, and we must content ourselves with such partial or approximate answers as can be obtained by laboratory experiments upon the comparatively small number of pathogenic organisms which are known to science and upon the various micro-organisms which abound in organic liquids undergoing putrefaction.

The problems above formulated open a wide field for experimental study, and the first (*a*) has already engaged the attention of a considerable number of experimentalists, who have determined with greater or less precision the relative value of numerous germicide agents. The published results of these investigations are not, however, always in accord, although the remarkable potency of certain substances is well established—*e. g.*, sulphurous acid, chlorine, iodine, mercuric bichloride. Conflicting results are to be ascribed to imperfect methods; faulty manipulation; differences in the physical condition of material disinfected—as to aggregation, desiccation, etc.; and to differences in the vital resistance to chemical reagents of the various organisms which have served as a test.

In the present paper the writer will confine himself to a statement of his own methods and results, and no attempt will be made to review the work of others; an undertaking which would involve a great amount of labour and research, and an expenditure of time which he prefers to devote to further experimental studies.

Method of Research.—To accomplish the object in view a method is required by which the various micro-organisms experimented upon may be isolated and "*pure cultures*" maintained for many successive generations.

This is effected in a very satisfactory manner by the method adopted in these experiments, which had previously been thoroughly tested, and

was first described by the writer in a paper read at the Cincinnati meeting of the American Association for the Advancement of Science (August 18, 1881).

The culture-flasks employed contain from one to four fluidrachms. They are made from glass tubing of three or four-tenths inch diameter, and those which the writer has used in his numerous experiments have all been home-made. It is easier to make new flasks than to clean old ones, and they are thrown away after being once used.

Bellows operated by the foot and a flame of considerable size—gas is preferable—will be required by one who proposes to construct these little flasks for himself. After a little practice they are rapidly made; but as a large number are required the time and labour expended in their preparation is no slight matter. Considerably more than a thousand have been used in the experiments herein reported.

After blowing a bulb at the extremity of a long glass tube, of the diameter mentioned, this is provided with a slender neck, drawn out in the flame, and the end of this is hermetically sealed. Thus one little flask after another is made from the same piece of tubing until this becomes too short for further use.

To introduce a culture-liquid into one of these flasks, heat the bulb slightly, break off the sealed extremity of the tube, and plunge it beneath the surface of the liquid. The quantity which enters will of course depend upon the heat employed and the consequent rarification of the inclosed air. Ordinarily the bulb is filled to about one-third of its capacity with the culture-liquid, leaving it two-thirds full of air, for the use of the microscopic plants which are to be cultivated in it. It is best not to trust to the sterilization of the culture-liquid previously to its introduction into the flasks; for, however great the precautions taken, many failures would be sure to occur as the result of contamination by atmospheric germs during the time occupied in the manipulations.

Sterilization is, therefore, effected by heat after the fluid has been introduced and the neck of the flask hermetically sealed in the flame of an alcohol lamp.

This may be accomplished by boiling for an hour or more in a bath of paraffine or of concentrated salt solution, by which a temperature considerably above that of boiling water is secured. The writer is in the habit of preparing a considerable number of these flasks at one time and leaving them, in a suitable vessel filled with water, for twenty-four hours or longer on the kitchen stove. Here the water-bath is kept boiling at intervals, and the contents of the flasks can scarcely fail of being subjected to a temperature approaching 212° for eight or ten hours. When the time is much less than this, failures in sterilization are likely to occur, and it is best to keep on the safe side.

The flasks are next placed in a culture-oven for two or three days, at a

temperature of 95–100° Fahr. (35–38° C.), to test the success of the previous operation, sterilization. If at the end of this time the contents remain transparent, and no film—*mycoderma*—has formed upon the surface of the liquid, the flasks may be put aside for future use, and can be preserved indefinitely.

To inoculate the liquid contained in one of these flasks with organisms from any source, the end of the tube is first heated to destroy germs attached to the exterior; the extremity is then broken off with sterilized—by heat—forceps; the bulb is very gently heated so as to force out a little air; and the open extremity is plunged into the liquid containing the organism which is to be cultivated. The smallest possible quantity of this is sufficient, and as soon as the inoculation is effected the end of the tube is again sealed in the flame of an alcohol lamp. A little experience will enable the operator to inoculate one tube from another; to introduce a minute quantity of blood containing organisms directly from the veins of a living animal; to withdraw a small quantity of fluid for microscopical examination, etc., without any danger of contamination by atmospheric germs. No other method with which I am acquainted offers such security as to sterilization of the culture-fluid and exclusion of foreign germs; and a somewhat extended experience has convinced me that it has also decided advantages on the score of convenience. In prosecuting the experiments herein recorded, I have been in the habit of filling a small culture-oven with flasks of this kind piled one upon the other, each being, of course, properly labelled, and I have had no difficulty in preserving for months pure cultures of the different micro-organisms which have been the subjects of my experimental studies.

The culture-fluid which has been chiefly used in these experiments is a *bouillon* made from the flesh of a rabbit. Beef-tea has also been used to some extent. All of the micro-organisms experimented upon multiply freely in the first-mentioned fluid, and beef-tea is a suitable culture-medium for all except the septic micrococcus.

The smallest quantity of fluid containing these micro-organisms, introduced into one of the little flasks containing sterilized *bouillon*, causes this to "break down" within twenty-four hours, if in the mean time it is exposed to a proper temperature.

My culture-oven has been kept as nearly as possible at a temperature of 100° Fahr. If a flask, which has been inoculated with living micrococci or other bacterial organisms, be examined after remaining twenty-four hours in the culture-oven, it will be apparent at a glance that a change has taken place in its liquid contents, which, instead of being transparent, have become opalescent or even milky in appearance. The smallest quantity of this fluid, examined under the microscope, will be found to contain a multitude of spheres or rods like those introduced, *as seed*. But if the vitality of the bacterial organisms introduced has been

destroyed prior to inoculation, by heat or by a chemical reagent, there will be no change in the contents of the flask, and the sterilized *bouillon* will remain transparent for an indefinite period.

To test the *germicide* power, then, of a chemical reagent, living bacteria are subjected to its action, in a known proportion, for a given time, and are subsequently used to inoculate sterilized *bouillon* in a culture-flask.

Failure to multiply in this fluid, when exposed for twenty-four hours or more to a temperature of 100° Fahr., is evidence that reproductive power—vitality— has been destroyed by the reagent used. On the other hand, failure to disinfect, *i. e.*, to destroy the vitality of the bacterial organisms used as a test, is shown by the "breaking-down" of the culture-fluid.

In the experiments herein recorded, failure to disinfect is indicated by a full-faced figure representing the *percentage* in which the disinfectant was used. The plain figure indicates failure to multiply in sterilized *bouillon*, or destruction of vitality by the agent used. Thus, the figures 1 and **0.5**, used with reference to the germicide power of carbolic acid, for example, indicate that the bacterial organisms experimented upon failed to multiply after being exposed to the action of one per cent. of this reagent, and that they did multiply after exposure to five-tenths per cent. In other words, one per cent. killed and five-tenths per cent. did not.

The mode of operating, in detail, is as follows:—

Standard solutions of the reagents to be tested are prepared with distilled water.

Glass tubes, two or three inches long, closed at one end, are made from tubing of about one-fourth inch diameter.

The "germs" are exposed to the action of the germicide agent in these tubes, which are supported in perforated corks, and covered with a bell-glass during the time of exposure.

In the experiments herein reported, the time of exposure to the action of the germicide agent was *two hours*. This is an important point, and one which must be borne in mind in comparing the results obtained with those reported by others. For it is evident that the vital resistance of the micro-organisms might be overcome by a more prolonged exposure; or that the germicide power of the reagent might be inadequate if the time allowed for its action were less.

The glass tubes are thoroughly sterilized in the flame of an alcohol lamp immediately before each experiment.

At the expiration of the time of exposure adopted as a standard, a small quantity of the fluid from one of these tubes is introduced into a culture-flask containing sterilized *bouillon*, and this, after being properly labelled, is placed in the culture-oven. This inoculation of the fluid in

one of the little flasks with organisms which have been exposed in one of the small glass tubes to the action of a chemical reagent, is very expeditiously accomplished. Experience proves that atmospheric germs do not gain admission to the interior of the flask during the operation, and that the results obtained are entirely trustworthy. This becomes apparent when these results are carefully considered; and *it will be found that while our preconceived notions may not in all cases be sustained, yet the results as a whole bear ample testimony to the reliability of the method.*

Thus, for example, nine experiments were tried with sodium borate, three different micro-organisms being used to test its germicide potency. And in every case the result was a failure, as shown by the breaking down of the culture-liquid inoculated with these organisms, after exposure to the reagent, in the percentage indicated below:—

Micrococcus of pus	**4. 2. 1.**
Septic micrococcus	**4. 2. 1.**
Bacterium termo	**4. 2. 1.**

If these experiments stood by themselves, the objection might be raised that the breaking down of the culture-liquid was due to the accidental admission of atmospheric germs, and not to the organisms purposely introduced. But look at the following results obtained with mercuric bichloride, the time of exposure and method of manipulation being exactly the same:—

Micrococcus of pus . . .	0.5, 0.25, 0.2, 0.1, 0.05, 0.02, 0.01, 0.005, **0.0025, 0.00125.**
Bacterium termo	1., 0.5, 0.25, 0.2, 0.1, 0.05, 0.025, 0.02, 0.01, **0.005.**

Here the agent used was efficient in all proportions above **0.005** per cent. for *B. termo* and **0.0025** per cent. for the *micrococcus of pus.*

Evidently the uniform failure in the first case, sodium borate, was not due to an accident which did not once occur in the large number of experiments made with mercuric bichloride. Again, take the following experiments with carbolic acid:—

Septic micrococcus . .	1., 0.5, 0.5, **0.25**, 0.25, **0.25, 0.12.**

Here, if we leave out experiment No. 5, we find a line very distinctly drawn between 0.5 per cent. and **0.25** per cent. In the proportion of one per cent. and of five-tenths per cent. (experiment in duplicate), this agent destroyed the vitality of the septic micrococcus; while in the proportion of twenty-five-hundredths per cent. (experiment in duplicate) and below, it failed to do so.

But how shall we explain the exception to this result which we have in the case of experiment No. 5? The explanation is easy, and the writer is only surprised that apparent contradictions of this kind have not been

more common. The aim has been to ascertain approximately the minimum quantity of each agent which would destroy the vitality of bacterial organisms, and no attempt has been made to render the conditions of the experiments *absolutely exact*. In so large a number of experiments, this would have added very much to the magnitude of the task undertaken. Thus, in diluting the standard solutions, which were carefully made in the first instance, it has been the custom of the experimenter to prepare, for example, three sterilized tubes; to fill one nearly full; to fill a second half full (by the eye); and a third one-fourth full. These tubes are then filled with a culture-liquid containing the organisms (usually from a culture-flask, in which they have developed during the preceding twenty-four hours). Suppose that the standard solution contained 4 per cent. of the reagent; then tube No. 1 would contain 4 per cent. nearly (a small drop only of the culture-fluid is added to this), tube No. 2 would contain 2 per cent., and tube No. 3 1 per cent. Moreover, the time of exposure necessarily varies somewhat. While two hours has been the standard time adopted, circumstances have sometimes made it impossible to conform strictly to this time, which has not infrequently been exceeded by a half-hour or even more than this. Contradictory results, then, occurring only on the boundary line between the percentage of a reagent which kills and that which fails, are fully explained and were *a priori* to have been anticipated.

In the experiments designed to determine the minimum quantity of a reagent which will prevent the multiplication of bacteria in a suitable culture-medium, the reagent was added to the culture-liquid in a definite proportion before this was introduced into the culture-flask. Sterilization was then accomplished in the usual way, by boiling, and the test was made by inoculating with bacteria from a fresh culture, and placing the flask, as before, in the culture-oven. If no development occurs, it is evidently because of the restraining influence of the reagent introduced; and by varying the proportion of this in a series of experiments, the minimum quantity which will effect this result is finally obtained.

Bacterial Organisms used in Research.—The micro-organisms which have been used in the experiments herein reported to test the germicide power of the reagents named, were obtained from the following sources:—

a. A micrococcus from gonorrhœal pus, the characters of which are described in detail in a paper published in *The Medical News* (Jan. 20 and 27, 1883).

b. A micrococcus from pus obtained from an acute abscess—whitlow—at the moment that it was opened by a deep incision. This micrococcus is morphologically identical with the preceding, and the writer has no evidence that it is a different species or that it was the cause of the deep-seated inflammation which resulted in the formation of an abscess.

c. A pathogenic micrococcus, having distinct morphological characters,

obtained from the blood of a septicæmic rabbit (septicæmia induced by the subcutaneous injection of human saliva).[1]

d. Bacterium termo and other bacterial organisms—micrococci and bacilli—from "broken-down" beef-tea which had been freely exposed to the air.

Pure cultures of the micrococci *a*, *b*, and *c* were obtained from the sources mentioned, and were maintained through a succession of culture-flasks without difficulty by the method already described. In a few instances, however, out of a very large number of experiments, microscopical examination has shown that bacteria other than those under cultivation have accidentally obtained admission to the culture-flasks. In this case fresh cultures were at once started, from pure stock kept constantly in reserve for this purpose, in hermetically sealed flasks.

In the experiments with broken-down beef-tea (*d*), no effort was made to exclude atmospheric germs, as these experiments were intended to show the minimum quantity of the reagents used which would destroy *all* bacteria developed in an organic solution freely exposed to the air.

These experiments have occupied a considerable portion of the writer's time during the past six months, and have been made with all the care possible. The results in many cases are quite different from what was anticipated. But in every case a sufficient number of experiments has been made to show that preconceived opinions, based upon the reputation of certain agents as disinfectants, were erroneous when in conflict with the results reported, and that these are entirely reliable.

RESULTS OF RESEARCH.—The results obtained will be given in tabular form. In Table No. 1 all experiments are given in which the micrococcus from pus was used as a test. But as there may be some question as to the identity of the micrococcus from gonorrhœal pus with that of pus obtained from an acute abscess, notwithstanding their morphological resemblance, the experiments in which micrococci from the first source were used will be designated, *a*, and those from the second, *b*. It will be remembered that the figures represent the percentage in which the chemical reagent was used; that the plain figure indicates destruction of vitality, as proved by failure to multiply; and that the full-faced figure indicates failure of the germicide agent, as proved by the subsequent multiplication of the micrococci subjected to its action. The time of exposure was two hours. The figures are arranged in the order in which the experiments were made, and this is an ascending or descending scale according as the first trials were above or below the limit which the experiments

[1] The following references are to papers by the writer relating to this septic micrococcus: Bulletin of the National Board of Health, April 30, 1881; Studies from the Biological Laboratory, Johns Hopkins University, vol. ii. No. 2, pp. 183-200; Medical Times, Philadelphia, Sept. 9, 1882, p. 837; Ibid. Nov. 4, 1882, p. 80; The Medical News, Philadelphia, July 8, 1882, p. 53; Ibid. Sept. 16th, p. 333.

were designed to establish, viz., the minimum quantity of each agent which will destroy the vitality of the micrococcus adopted as a test, in the time mentioned.

TABLE I.—*Experiments to determine the germicide value of the reagents named* (arranged alphabetically).

Alcohol (*a*) **25, 50,** 95.
" (*b*) 40, **20.**
Arsenite of potassa (Fowler's solution) **4, 8, 10, 20, 20, 40.**
Boracic acid (*a*) **0.5, 1, 1, 2, 4.**
Carbolic acid (*a*) 2, 1.25, 1, 0.8, **0.5, 0.5.**
" " (*b*) **0.5.**
Caustic potash (*b*) **2, 4, 4, 8,** 10, 20.
Chloral hydrate (*b*) **5, 5, 10,** 10, 20.
Citric acid (*b*) **6, 6, 10,** 12.
Creasote (*b*) **1,** 0.5, 0.5, **0.25.**
Ferric sulphate (*a*) **4, 8, 16.**
Ferri chloridi tincturæ (*a*) **0.25, 0.5, 1, 1, 2, 2,** 4, 4.
Hydrochloric acid (*b*) **1, 0.5, 0.25.**
Iodine, dissolved by means of potassium iodide q. s. (*a*) 0.5, 0.2, 0.2, **0.1. 0.1, 0.05.**
Mercuric bichloride (*a*) 0.5, 0.25, 0.2, 0.1, 0.1, 0.05, 0.025, 0.02, 0.02, 0.01, 0.01, 0.005, 0.005, 0.005, 0.0025, **0.0025.**
" " (*b*) **0.00125.**
Potassium iodide (*a*) **1, 2, 4, 8.**
Potassium permanganate (*b*) 4, 2, 1, 0.5, 0.25, 0.12, 0.12, **0.06.**
Salicylic acid and sodium biborate, equal parts (*a*) **0.5, 1, 2,** 2, 4.
Sodium biborate (*a*) **1, 2,** 4.
Sodium salicylate (*a*) **1, 2, 4.**
Sulphuric acid c. p. (*a*) 1, 0.5, 0.5, 0.25, **0.25, 0.1.**
Sodium hyposulphite (*a*) **2, 2, 4, 4, 8, 16, 32.**
Sodium sulphite exsiccata (*a*) **2, 4, 5, 10.**
Zinc chloride (*a*) **2, 2, 1, 0.5.**
Zinc chloride liquor (Squibb's) (*b*) **1, 2, 4, 4, 8.**
Zinc sulphate (*b*) **2, 4, 8, 20.**

It will be noticed that a considerable number of reputed disinfectants and many approved therapeutic agents which may be supposed to act as germicides do not appear in this list. This is not because they have been overlooked, but the labour involved in a series of experiments of this nature is so great that the writer has been obliged to make a selection and to leave to others who may have better facilities for pursuing work of this kind, the task of completing the list, if it seems to them worth while to do so.

Upon inspecting Table I. we find a few reagents which have very decided germicide power, while the greater number, including several which are commonly believed to be efficient *disinfectants*, *e. g.*, ferric sulphate, boracic acid, sodium hyposulphite, exhibit very little potency or none at all.

Rearranging the list according to the germicide value of the agents named we have the following:—

TABLE II.

		Efficient in the proportion of
Mercuric bichloride (0.005 per cent.)	one part in	20000
Potassium permanganate (0.12 per cent.)	" "	833
Iodine (0.2 per cent.)	" "	500
Creasote (0 5 per cent)	" "	200
Sulphuric acid (0.5 per cent.)	" "	200
Carbolic acid (1 per cent.)	" "	100
Hydrochloric acid (1 per cent.)	" "	100
Zinc chloridi (2 per cent.)	" "	50
Tinct. ferri chloridi (4 per cent.)	" "	25
Salicylic acid dissolved by sodium borate (4 per cent.)	" "	25
Caustic potash (10 per cent.)	" "	10
Citric acid (12 per cent.)	" "	8
Chloral hydrate (20 per cent.)	" "	5

The following named reagents, as far as the experiments go, are not shown to have any germicide value, viz.:—

Fowler's solution (arsenite of potassa)	failed in the proportion of		40	per cent.
Sodium hyposulphite	" " "		32	"
Sodium sulphite, exsiccata	" " "		10	"
Ferric sulphate (saturated solution)	" " "		16	"
Potassium iodide	" " "		8	"
Liq. zinci chloridi	" " "		8	"
Zinc sulphate	" " "		20	"
Boracic acid (saturated solution)	" " "		4	"
Sodium borate (saturated solution)	" " "		4	"
Sodium salicylate	" " "		4	"

Having ascertained the germicide value of certain reagents for a single micro-organism, the question arises as to whether we are justified in assuming that other organisms of the same class, and especially pathogenic bacteria, will be destroyed by the same reagents in like proportion. Or, in other words, whether we can generalize from the data obtained. It is evident that if each of the reagents named gives identical results with several distinct species of bacteria we will be justified in assuming that the value obtained will be constant for other organisms, known or unknown, of the same class. Whereas, if marked differences are found, as to the vital resistance of different bacterial organisms to these reagents, no generalization will be possible; and the value for each distinct organism of the class can only be fixed by experiment. To solve this question experiments have been made as follows:—

(*a*) Upon the *micrococcus of pus* (already reported in Table I.).

(*b*) Upon the *micrococcus of septicæmia* in the rabbit.

(*c*) Upon *bacterium termo*, in its active motile stage, as found in a fresh culture.

(*d*) Upon the bacteria in broken-down beef-tea which had been freely exposed to the air, and in which all active development had ceased. The results of these experiments are given in the following table.

TABLE III.—*Experiments to determine the Germicide Value of the Reagents named.*

Reagent.	(*a.*) M. of pus.	(*b.*) M. of septicæmia.	(*c.*) B. termo.	(*d.*) Broken-down beef-tea.
Mercuric bichloride	0.005, 0.005, 0.005, 0.0025, **0.0025, 0.00125, 0.0025**	0.005, 0.005, **0.0025, 0.0012**	0.01, **0.005**	0.01, **0.005**
Iodine dissolved by potassium iodide	0.2, 0.2, 0.1, 0.1, **0.05**	0.2, 0.1, 0.1, **0.05, 0.025**	0 2, **0.1, 0.05**	0.25, 0.2, **0.12, 0.12**
Sulphuric acid	0.5, 0.5, 0.25, **0.25, 0.1**	0.25, 0.25, 0.12, **0.06, 0.025**	1, 0.5, **0.25**	**1, 2, 4, 4**
Carbolic acid	1, 0.8, **0.5, 0.5**	0.5, 0.5, **0.25, 0.25**	1, 1, 0.5, **0.5**	**1, 2, 4, 4, 4**
Zinc chloride	**0.5, 1**, 2, 2	0.5, 1		
Tr. ferri chloridi	**1, 2, 2, 4, 4**	**1, 2, 2, 4, 4**	**1, 2, 4**	
Salicylic acid and sodium biborate, equal parts	**1, 2**, 2, 4	**1, 2, 2**, 4	**1, 2**, 2, 4	**4**
Caustic potash	**4, 8**, 10, 20	**1, 1, 2, 2**, 4		**8, 10**, 20
Alcohol	**20, 25**, 40, 95	**6, 12**, 24, **25, 50**	**25, 50, 95**	**95** (24 hrs.) **95** (48 hrs.)
Sodium hyposulphite	**8, 16, 32**	**4, 8**	**8, 16, 32**	*Saturated.*
Sodium sulph. exsiccata	**5, 10**	**5, 10**	**5, 10**	*Saturated.*
Ferric sulphate	**4, 8, 16**	**8, 16**	**8, 16**	*Saturated.*
Potassium iodide	**2, 4, 8**		**4, 8**	*Saturated.*
Boracic acid	**1, 2, 4**	**1, 2, 4**	**1, 2, 4**	
Sodium biborate	**1, 2, 4**	**1, 2, 4**	**1, 2, 4**	
Sodium salicylate	**1, 2, 4**	**1, 2, 4**	**1, 2, 4**	

An inspection of the table shows that, in general, those reagents which destroyed the vitality of the micrococcus from pus (Table I.) are destructive of other organisms of the same class; and that their relative value as germicides (as shown in Table II.) is not changed when a different micro-organism is used as the test of this value. Moreover, the reagents which were found to be practically valueless as germicides in the first series of experiments, *e. g.*, ferric sulphate, sodium sulphite and hyposulphite, boracic acid, etc., proved to be equally without value when the test was extended to other micro-organisms of the same class. But the reagents found to possess decided germicide power have, in some cases, a different value for different organisms. In other words, the vital resistance of different bacterial organisms to the reagents in question is not in all cases the same.

Thus, *iodine* failed to destroy the vitality of B. termo and of the micrococcus from pus in the proportion of 0.1 per cent.; while the septic micrococcus was destroyed by 0.1 per cent., but not by one-half of this amount (0.05 per cent.).

Sulphuric acid failed to destroy B. termo and the micrococcus from pus in the proportion of 0.25 per cent.; but one-fourth of this amount (0.06 per cent.) destroyed the vitality of the septic micrococcus.

Carbolic acid failed to destroy the micrococcus from pus in the proportion of 0.5 per cent.; but this amount was fatal to the septic micrococcus.

Zinc chloride failed to destroy the first-named micrococcus in the proportion of 1 per cent.; but one half this amount was fatal to the pathogenic micrococcus, septic.

Caustic potash destroyed the septic micrococcus in the proportion of 2 per cent., but failed to kill the micrococcus of pus in four times this amount (8 per cent.).

Tr. ferri chloridi killed the two species of micrococcus in the proportion of 4 per cent., but failed to destroy B. termo in this proportion.

Alcohol destroyed the vitality of the septic micrococcus in the proportion of 24 per cent., and the micrococcus from pus in the proportion of 40 per cent.; but 95 per cent. did not kill B. termo; and the bacteria from broken-down beef-tea were not killed by being immersed in 95 per cent. alcohol for forty-eight hours.

When we compare the vital resistance of the organisms in the first three columns with that of those from broken-down beef-tea which had been standing for a considerable time in the laboratory in an uncorked bottle, we find a very marked difference, especially with certain reagents. Thus, both sulphuric acid and carbolic acid, in the proportion of 4 per cent., failed to sterilize this broken-down beef-tea; while 1 per cent., or less, was fatal to B. termo in a state of active growth and to the two species of micrococcus. This difference is not as marked, however, in the case of

mercuric bichloride and of iodine, and it is evident that we have in these substances germicide agents of the highest value.

As disinfectants, these reagents may be safely recommended for the destruction of all "germs" of the character of those employed as a test in these experiments, *i. e.*, bacterial organisms and reproductive spores of the same.

The proportion in which they would certainly be efficient may be given as 0.02 per cent., or one part in five thousand for mercuric bichloride; and 0.5 per cent., or one part in two hundred for iodine.

The poisonous properties and want of colour of a solution of corrosive sublimate of the proper strength, make this of doubtful utility for general use in the sick-room; but in iodine we have an agent which might be used in aqueous solution with potassium iodide, for disinfecting spittoons, bed-pans, etc.

The experiments with potassium iodide show that this salt has no germicide value of its own.

The value, *as a germicide*, of the solution of ferric sulphate and sulphuric acid, in water, which has been extensively recommended by sanitarians as a *disinfectant*, evidently depends upon the sulphuric acid which the solution contains. To insure the destruction of all bacterial organisms and of the reproductive spores of those species which multiply by spores as well as by transverse fission, such a solution should be used in sufficient quantity to subject the material to be disinfected to the action of the acid in the proportion of at least 5 per cent. for a period of two hours.

The quantity of carbolic acid used to accomplish the same result should not be less than this, 5 per cent.; for it is necessary to keep on the safe side, and we do not know at present whether all of the pathogenic bacteria, hypothetical or demonstrated, form spores or otherwise. In the case of the anthrax bacillus and of Koch's bacillus of tuberculosis, this has been proved to be true; and we have ample experimental evidence to show that these reproductive bodies possess very great resistance to heat and to those chemical reagents which destroy bacterial organisms in their ordinary condition of rapid growth and multiplication by fission.

These remarks, relating to the practical value as disinfectants of the reagents which have been the subject of the experiments herein reported, are made *en passant*, the main object in view having reference rather to the value of these reagents in medical and surgical practice, either as germ destroyers or as capable of restricting germ multiplication within the living body and in surgical lesions.

Evidently therapeutic value—assuming the correctness of the germ-theory—cannot be gauged by germicide power alone, for it is possible that a reagent which possesses this power in but slight degree, or not at all, may nevertheless be capable of *restricting the development* of pathogenic organisms, and thus limiting their power for mischief.

To judge of the therapeutic value of a reagent from this point of view, we should know the minimum quantity which will prevent the development of germs. Using as a test the same organisms as in previous experiments and the method already described (p. 322), we have the following results :—

TABLE IV.—*Experiments to determine the Minimum Quantity of the Reagents named which will Prevent the Development of Bacterial Organisms.*

Reagent.	M. of pus.	Septic M.	B. termo.
Mercuric bichloride	0.012. 0.006, 0 003, **0.0015**	0.005, 0.0025, **0.0012**	0.012, 0.006, 0.003, **0.003, 0.0015**
Iodine	0.05, 0.025, **0.012, 0.025**	0.025, **0.012 0.006**	0.05, 0.025, **0.012, 0.025, 0.012**
Sulphuric acid	0.25, 0.12, **0.06, 0.03**	0.25, 0.12. 0.12, 0.06, **0.06, 0.03, 0.03**	0.25, 0.12, **0.06, 0.03**
Carbolic acid	0 2, 0.2, **0.1, 0.1, 0.05, 0.05**	0.2, **0.1, 0.05**	0.2, **0.1, 0.05**
Salicylic acid and sodium biborate, equal parts	1, 0.5, **0.25, 0.125**	1, 0.5, 0.25, 0.12, **0.12, 0.12, 0.06**	1, 0.5, 0.25, 0.12
Sodium hyposulphite	**0.5, 1, 2, 2, 4, 8**	**0.5, 1, 2, 4, 8**	
Ferric sulphate	4, 2, 1. 0.5, 0.5, **0.25, 0.12, 0.06**	0.5, **0.25, 0.12**	4, 2, 1, 0.5, 0.5, **0.25, 0.12, 0.06**
Boracic acid	0.5, **0.25, 0.12**	1, 0.5, 0.25, **0.12, 0.06**	0.5, 0.25, 0.12
Sodium biborate	2, 1, 0.5, **0.5, 0.25**	1, 0.5, 0.25, **0.12, 0.06**	1, 0.5, 0.25, **0.12**
Alcohol	20, 10, **5, 5**	**2.5, 2.5, 5**	

We note, first, that the results are pretty uniform for the three different organisms. Thus, in the case of ferric sulphate, 0.5 per cent. and above prevented multiplication of each of the test organisms (experiment in duplicate for M. of pus and B. termo), while 0.25 per cent. and below failed in every instance. In the case of sulphuric acid, 0.12 per cent. prevented multiplication, and 0.06 per cent. failed in every instance except one. In two experiments in which this proportion of the reagent was used, the test being the septic micrococcus, a contradictory result was obtained. This was also the case in two of the experiments with iodine, 0.025 and **0.025** (first column), and in two of those with mercuric bichloride, 0.003, **0.003** (third column). As already explained (p. 327), these contradictory results are to be attributed to the fact that the per-

centage of the reagent is on the boundary-line between success and failure, and that the time of exposure to the action of the reagent has not in all cases been exactly the same. This explanation will not answer, however, for the difference in susceptibility shown to the action of boracic acid, sodium biborate, and salicylic acid dissolved by means of sodium biborate, for with each of these reagents a smaller proportion prevents development in the case of B. termo than in that of the micrococcus from pus. We have already seen that these reagents in a saturated solution (4 per cent.) possess no germicide value, but we now see that *they are nevertheless potent antiseptics, by virtue of their power to prevent the development of septic organisms*, and that this power is more decided in the case of bacterium termo, which is essentially a putrefactive organism, than in that of the micrococcus of gonorrhœal pus, which we believe to be identical with M. ureæ (Cohn). (See paper published in *The Medical News*, l. c.)

Comparing now the quantity of each reagent required to destroy vitality with the minimum quantity which will prevent development, we have for the micrococcus of pus the following figures (taken from Tables I. and IV.):—

TABLE V.

Reagent.	Percentage required to destroy vitality.	Percentage capable of preventing development.
Mercuric bichloride . . .	0.005, 0.0025	0.003, 0.0015
Iodine	0.2, 0.1	0.025, 0.012
Sulphuric acid	0.25, 0.25, 0.1	0.12, 0.06
Carbolic acid	0.8, 0.5	0.2, 0.1
Salicylic acid and sodium biborate	4, 2, 2	0.5, 0.25
Alcohol	20, 25, 40, 95	20, 10, 5, 5
Sodium hyposulphite . . .	32	4, 8
Ferric sulphate	16	0.5, 0.25
Boracic acid	4	0.5, 0.25
Sodium biborate	4	1, 0.5, 0.5

An inspection of the table shows that the potent germicides in our list restrict multiplication in quantities considerably less than are required to destroy vitality. In the case of iodine, the difference is eightfold; in that of carbolic acid, fourfold; in that of sulphuric acid, twofold, etc.

We also see that the three agents at the bottom of the list—ferric sulphate, boracic acid, and sodium biborate—in the proportion of five-tenths per cent. prevent the multiplication of bacterial organisms, and are consequently antiseptic agents of value, although in saturated solution they fail to kill these organisms.

In the case of ferric sulphate, and also of zinc sulphate and zinc chloride, this power to prevent the development of micro-organisms seems to be due to precipitation of the organic material in the nutritive medium rather than to any direct action upon the living organisms, which, as we have seen, are not killed by a far greater quantity of the reagent.

This explanation will not answer for borax and boracic acid, as these reagents do not cause a precipitation of the albuminoid material in the *bouillon* used as a culture-fluid.

Let us now consider the therapeutic possibilities from the point of view we have taken, as regards the different reagents which have been selected for this research; and, comparing these with the results of clinical experience, let us inquire whether the "germ theory" receives any support from the experimental data recorded.

Mercuric Bichloride.—The value of this potent agent as a parasiticide for external use is well established. The question now under consideration is whether it is practicable to use it in sufficient quantity to take advantage of its germicide power for the purpose of destroying or restricting the development of internal parasites located in the blood, or in the tissues, *e. g.*, the bacillus of tuberculosis(?), the bacillus of syphilis(?), etc. etc.

The proportion in which this reagent prevents the development of the septic micrococcus is 0.0025 per cent. equal to one part in 40,000. It is probable that a proportion considerably below this may have some restraining influence, and, perhaps, some of the pathogenic organisms are more susceptible than this micrococcus to its action. But, reasoning from the experimental data at hand, let us see if the required amount could be administered medicinally.

Physiologists estimate the blood to constitute one-eighth of the weight of the body, which for a man weighing one hundred and sixty pounds would amount to twenty pounds. The quantity of mercuric bichloride required to prevent the development of the septic micrococcus in this amount of blood would be three and one-half grains.

"The dose of corrosive sublimate is from the twelfth to the quarter of a grain repeated three or four times a day." (*U. S. Dispensatory.*) "The smallest dose which is reported to have destroyed life is *three* grains. This was in the case of a child." (*Taylor's Medical Jurisprudence*, p. 130.)

Probably one grain per day is the maximum quantity which could be administered medicinally for several days in succession, and it is evident that the amount required to obtain the germicide action of the reagent upon parasitic micro-organisms in the blood or in the tissues could not be obtained by these doses, unless there is an accumulation in the system from incomplete elimination of the poison. That this is the case has been demonstrated by experiment.

"If treatment have been continued some time, mercury may be found in the urine for several days afterward; thus, in the urine of two patients who took ½ grain daily for ten or twelve days, the drug was found for four or five days after treatment had been omitted. . . . Years after its prolonged administration unusual perspiration may develop dark mercurial stains on the linen. . . . I have myself seen five patients while under the influence of nitric acid, suffer from salivation and other physiological symptoms of mercury, and none of these had taken that drug for over eighteen months previously: I considered it clearly traceable to mercury in the system and not to the acid." (*Phillips's Materia Medica and Therapeutics*, vol. ii. p. 191.)

In view of these facts it is not difficult to believe that the bichloride may be introduced into the system in quantities sufficient to restrain the development of parasitic micro-organisms, and we will have a satisfactory explanation of the *modus operandi* of this remedy in syphilis, if this is eventually demonstrated to be a "germ" disease.

Diphtheria.—A medical friend, who has just returned from Vienna, informs me that mercuric bichloride is at present the favourite remedy in that city for diphtheria.

Enteric Fever.—"Several eminent physicians abroad—Traube, Wunderlich, Liebermeister, and others—have recently recommended a 'specific' treatment for the first nine days of this fever by calomel. They claim for these doses an antipyretic effect, and a power of lessening both the duration and mortality of the disease." (*Medical Times*, ii. 1876.) . . . "Corrosive sublimate in minute quantities has also proved valuable in typhoid diarrhœa." (*Materia Medica and Therapeutics*, Phillips, vol. ii. p. 217.)

Erysipelas.—"In many cases of phlegmonous erysipelas, especially when occurring in strumous subjects, I have found the internal administration of corrosive sublimate distinctly useful." (Phillips, *l. c.*, p. 217.)

Dysentery.—"In acute dysentery, with violent pain, severe prostration and frequent muco-sanguineous stools, small doses of corrosive sublimate given at short intervals, commonly relieve in a few hours, and almost in a 'specific' manner." (Phillips, *l. c.*, p. 222.)

These quotations suffice to show that this potent germicide agent, notwithstanding the reaction against mercurials which has occurred during the past thirty years, has a prominent place in modern therapeutics as a remedy for the very diseases which there is the most reason to believe are produced by parasitic micro-organisms.

Iodine.—The quantity of iodine required to prevent the development of the test organisms was the same for all three, viz., 0.025—or one part in four thousand. The same computation made in the case of mercuric bichloride gives us thirty-five grains as the quantity which would be required to prevent the development of these organisms in the blood of an adult weighing 160 pounds. In a culture-fluid containing one half this amount, all of the test organisms multiplied abundantly. It is evident, therefore, that to restrict the multiplication of pathogenic organisms of the same class, in the blood or in the tissues, doses would be required which it is entirely impracticable to administer. For iodine is rapidly eliminated by the kidneys, and the maximum dose which can be given with safety is very far below this amount.

The dose of liquor iodinii compositus is six drops, containing about a quarter of a grain of iodine, three times a day. The dose of the tincture is from ten to twenty drops, which may be gradually increased to thirty or forty drops three times a day. (*U. S. Dispensatory.*) The alkaline iodides, however, may be given in enormous doses. Thus, iodide of potassium has been given in doses of two, four, or even six drachms daily, without inconvenience (*loc. cit.*). But as our experiments show that this salt has no germicide power its recognized value in syphilis and in

tubercular meningitis cannot be accounted for upon the hypothesis that it restrains the development of the germs of these diseases, unless it can be shown that it is decomposed in the system and that the iodine is set free.

In syphilitic cases which have previously been subjected to a mercurial course, it is known that decomposition does take place, and the beneficial action of the iodide is ascribed by some to its power to render active the mercury stored away in the tissues. But as cases not previously treated with mercury are also benefited (Van Buren and Keyes), this explanation is not sufficient.

In iodoform we have an agent which permits of the introduction of iodine into the system in larger doses than are tolerated when the element is given uncombined in the form of tincture or in solution with potassium iodide. And we have evidence that this substance is not eliminated so readily as is the potassium salt, and that it is decomposed within the body. Still it does not seem practicable to administer it in sufficient quantity to take advantage of the germicide power of iodine for the destruction of pathogenic bacteria in the blood or tissues. Clinical experience is in accord with our experimental data in this regard; for iodine is confessedly not a *specific* in those diseases in which it has the greatest reputation as a remedy of value—*e. g.*, phthisis, scrofula, syphilis. Its therapeutic applications are largely local rather than general, and admit of its use in quantities sufficient to kill germs—*e. g.*, as a local application in erysipelas, in diphtheria, and by inhalation, in phthisis.(?)

The benefit said to be derived from the administration of tincture of iodine in intermittent fever may also be due to its local action in destroying "malarial germs" in the alimentary canal.

Sulphuric Acid.—As the normal reaction of the blood is alkaline, we cannot hope to introduce medicinally a mineral acid into this fluid for the purpose of destroying germs in it, or in the tissues through which it circulates. The germicide power of sulphuric acid, then—which is about equal to that of iodine—is even less available for internal use than is that of the last-named reagent; that is to say, for internal administration with reference to a general effect. But for the destruction of pathogenic organisms in the alimentary canal, this acid should be available and useful. That it is so is indicated by the following quotations from a recent treatise upon Therapeutics (Phillips, *loc cit.*):—

"Dilute sulphuric acid has a well-deserved reputation in various forms of intestinal flux, and especially in summer diarrhœa of a choleraic character."

"*Cholera.*—Dr. Curtin has recorded that a severe epidemic in an institution under his direction ceased within twelve hours after the inmates were treated with sulphuric-acid lemonade."

"In the diarrhœa of enteric fever, H. Kennedy, Murchison, and other authorities, advocate the use of sulphuric acid."

Aromatic sulphuric acid has been recommended in epidemic dysentery (*U. S. Dispensatory*). It seems not at all improbable that the benefit

derived from this and other mineral acids, in the above-mentioned diseases, is in great part due to their germicide power; for there can be very little doubt that diseases of this nature are due, directly or indirectly, to the vital activity of living ferments.

Carbolic Acid.—The experimental data recorded do not favour the idea that in carbolic acid we have a cure-all for germ-diseases any more than in iodine, or in sulphuric acid; and all of these reagents fall far below mercuric bichloride, which, so far as our experiments go, is the only remedy which approaches the rank of a panacea from this point of view. But the demonstrated potency of carbolic acid as a germicide is in accord with its recognized value as an antiseptic in surgical practice, and its anæsthetic and non-irritating properties give it special advantages over the agents previously mentioned for external use.

Carbolic acid has been administered with success in intermittent fever and in dysentery. Its beneficial action in these diseases is very possibly due to its germicide power. For, like sulphuric acid, it may be introduced into the alimentary canal in quantities which may justify us in believing that pathogenic organisms in the *primæ viæ* would be destroyed by it; although it seems quite out of the question to restrict the development of parasitic bacteria in the blood with an agent which fails to prevent the multiplication of the septic micrococcus in a culture-fluid in which it is present in the proportion of one part in a thousand. The quantity which should be present in the blood of our standard adult, weighing 160 pounds, to accomplish the desired purpose, would be considerably above half an ounce of the pure acid.

If, then, hypodermic injections of a few grains have a beneficial effect in "germ diseases," it must be for some reason independent of the germicide power of the agent.

Salicylic Acid.—In my experiments with this reagent it has been dissolved by means of sodium biborate, which, by itself, in saturated solution, has no germicide power. A two per cent. solution was found to destroy the vitality of the micrococcus of pus, and in the proportion of five-tenths per cent. the solution prevented the multiplication of the same micrococcus. This, however, is not superior to the value established for sodium biborate alone. We find, by reference to Table IV., that the solution of salicylic acid and sodium biborate prevented the development of *B. termo* in the proportion of 0.12 per cent. The antiseptic value is, therefore, about the same as that of carbolic acid; and in selecting one or the other of these agents as an antiseptic for external use, we may be governed by other properties which seem advantageous—such as solubility, non-irritant action, etc.

Salicylic acid has been strongly recommended by Dr. Keating, of Philadelphia, in the acid diarrhœas of children. In this case there can be little doubt that the benefit derived from its use is to be ascribed to its power of

destroying or restraining the vital activity of the living ferment, to which the acid fermentation in the intestine is due.

Alcohol.—The value of alcohol as a germicide is so slight that its favourable action in supposed germ diseases requires some other explanation than that which assumes that it may destroy parasitic micro-organisms in the circulation. The amount of 95 per cent. alcohol required to destroy the septic micrococcus in twenty pounds of blood, would be something like four or five pounds, and to restrict the multiplication of the same organism, from one to two pounds should be constantly present in the circulating fluid; for this micrococcus multiplies freely in a culture-fluid containing five per cent. of alcohol.

It is of course quite possible that other pathogenic organisms are more susceptible to the influence of this, and of other reagents, than are the test-organisms which have been selected for these experiments. This is, indeed, rendered probable by the very marked difference shown in the vital resistance of Bacterium termo, and of the septic micrococcus to the reagent in question.

The first-named organism in a fresh culture was not killed by immersion in 95 per cent. alcohol for two hours. And the vitality of the same organism in "broken-down" beef-tea, old stock, containing reproductive spores, was preserved after forty-eight hours' immersion in 95 per cent. alcohol, while the septic micrococcus was not able to resist the same reagent in the proportion of 24 per cent.

Sodium Hyposulphite.—Our experiments show that neither the sulphite nor the hyposulphite of soda possesses any germicide value. And the last-named salts failed to prevent the multiplication of the micrococcus of pus when present in a culture-fluid in the proportion of eight per cent. But sulphurous acid is undoubtedly a potent germicide, and if this acid is set free by the decomposition of the sulphites when these salts are administered internally, we can readily understand that they may have a decided therapeutic value as germicides and antiseptics, notwithstanding the negative results obtained in laboratory experiments with a *neutral* culture-medium. The results thus far reported from the medicinal use of these salts have not, however, justified the sanguine expectations of Dr. Polli, of Milan, who first brought them into notice, and it may, perhaps, be safely said that their negative value as shown by our culture experiments is in accord with clinical experience.

Ferric Suphate and Zinc Sulphate.—A saturated solution of ferric sulphate does not kill any of our test organisms, and the use of this reagent as a *disinfectant* would evidently be a serious error. It has, however, a decided value as an *antiseptic* agent, being effectual in the proportion of five-tenths per cent. The extended use, therefore, which sanitarians make of a solution of sulphate of iron, with *sulphuric acid*, in the treatment of foul privy vaults, etc., is justified by exact experiments. But it must be

remembered that the iron salt in this solution does not play the part of a germ destroyer, and if the object is to *disinfect* material supposed to contain the germs of diphtheria, of typhoid fever, of cholera, etc., a sufficient quantity of sulphuric acid must be present in the disinfecting solution to insure the accomplishment of the desired result. Sulphate of zinc in the proportion of 20 per cent. also failed to give evidence of any germicide power. The chloride of zinc was effectual in the proportion of 2 per cent., but the standard solution supplied as a disinfectant, liquor zinci chloridi (Squibb's) failed in the proportion of 8 per cent.

Our experiments, therefore, show that these salts, while they possess considerable antiseptic power, are entirely unreliable as disinfectants.

The *modus operandi* of the antiseptic action of ferric sulphate and of the other salts named seems to depend upon the power to coagulate and render insoluble the albuminous ingredients of a culture-medium and thus to prevent the development of septic organisms by depriving them of the pabulum required for their growth.

In the proportion in which these agents have been found to restrict the development of our test organisms, they have invariably caused a precipitation of the organic material in the culture-fluid—*rabbit-bouillon*.

The same effect is produced by tincture ferri chloridi, which is consequently an antiseptic agent of value. But this preparation has also the germicide power of the free hydrochloric acid which it contains, and the benefit derived from its local use in diphtheria and in erysipelas may be accounted for in this way. In the proportion of 4 per cent. it destroyed both the septic micrococcus and the micrococcus of pus.

The fact that exposure to the action of a 20 per cent. solution of zinc sulphate for two hours, failed to destroy the vitality of the micrococcus of pus, shows conclusively that the therapeutic value of this salt, in dilute solution, in gonorrhœa, ophthalmia, etc., is not due to germicide power. This is in accord with the results obtained by the writer in a recent series of experiments which show that the virulence of gonorrhœal pus is not due to the presence of the micrococcus found in it. (*Medical News*, Jan. 20 and 27, 1883.)

Boracic Acid and Sodium Biborate.—These reagents were equally inefficient as germ destroyers, but both possess considerable antiseptic power. They are especially efficient in restricting the multiplication of the putrefactive organism *B. termo*.

As the micrococcus of pus is less susceptible to their influence (see Table IV.), we can understand how this organism is sometimes found in pus from wounds treated antiseptically with boracic acid while no evidence of putrefaction is perceived. The therapeutic value of a weak solution of sodium biborate as an injection into the bladder in chronic cystitis attended with alkaline, or putrid, decomposition of the urine is also explained by the power of this reagent to restrict the development of

the organisms which are the cause of alkaline and putrefactive decomposition.

COMPARISON OF RESULTS WITH THOSE OBTAINED IN A FORMER SERIES OF EXPERIMENTS BY A DIFFERENT METHOD.—In the summer of 1881, the writer made a series of experiments in the biological laboratory of Johns Hopkins University, Baltimore, Md., to determine the comparative value of various disinfectants (*vide* Bulletin Nat. Board of Health, July 23, 1881; also "Studies from Biological Laboratory," vol. ii. No. 2, pp. 201–212).

As the same reagents have been tested by a different method in the two series of experiments, it will be profitable to compare the results obtained, which we do in the following table.

In the Baltimore experiments, the test organism was the septic micrococcus *in the blood of a rabbit* just dead from septicæmia due to its presence. This blood was found to produce fatal septicæmia in other rabbits when injected subcutaneously in the smallest quantity. The test of disinfection—germicide power—was the failure of septic blood to kill rabbits after treatment with the disinfecting agent. The time of exposure to the action of the disinfectant was half an hour (in present series of experiments two hours).

Arranging our experiments upon the septic micrococcus in a culture-fluid (Table III.) in one column, and those upon the same organism in the blood of a septicæmic rabbit in another, we find that the results obtained in the two series of experiments correspond very closely. This correspondence serves to prove the reliability of these results in each series by the other. And also to substantiate the deduction made as the result of other experiments (*vide* papers referred to on page 328) with reference to the pathogenic properties of the micrococcus in question.

For, evidently, the virulence of the septic blood depends upon the vitality of the micrococcus contained in it, and *disinfection*, *destruction of virulence*, *and destruction of the vitality of the micrococcus*, are synonymous terms.

It will be remembered that in the second column the full-faced figures represent the death of a rabbit from septicæmia after injection with septic blood exposed for half an hour to the action of the disinfectant named, in the proportion indicated by the figures. The plain figure indicates that the disinfecting agent destroyed the virulence of the septic fluid, and that the test-rabbit survived the injection.

TABLE VI.

Reagents.	Recent experiments, septic micrococcus.	Balt. experiments, septic blood.
Iodine	0.2, 0.1, **0.05**	0.25, 0.2, **0.1**
Sulphuric acid	0.25, 0.12, **0.06**	1.25, 0.5, **0.25**
Carbolic acid	0.5, **0.25**	1.25, **0.5**
Caustic potash	4, 2, **2**, 1	2.5, 1, **0.5**
Alcohol	24, **12**	**25**, **12**

When the difference in time of exposure to the action of the disinfecting agent, in the two series of experiments, is considered, it will be conceded that the correspondence is sufficiently close to justify the claim that there is "cross-proof" of the approximate accuracy of the results obtained in each.

We have excluded from this list all reagents except those which have absolute germicide power; for it is evident that the comparison cannot be fairly made in the case of antiseptics, such as ferric sulphate and boracic acid, which restrict the multiplication without destroying the vitality of our test-organisms.

Conclusions.—The vital resistance of bacterial organisms to chemical reagents differs, within certain limits, for different species. And certain species show special susceptibility to the germicide action of particular reagents, *e. g.*, the sceptic micrococcus to alcohol and *B. termo* to boracic acid.

There is, therefore, reason for supposing that different pathogenic organisms may differ, in like manner, as to susceptibility to the action of various agents administered medicinally with a view to their destruction. Nevertheless, the *comparative* germicide value of the reagents tested is the same for the several test-organisms, and, allowing certain limits for specific peculiarities, it is safe to generalize from the experimental data obtained in the practical use of these reagents as disinfectants. But it must be remembered that the resisting power of reproductive spores is far greater than that of bacterial organisms in active growth (multiplication by fission) and the data obtained for the latter cannot be extended to include the former.

The *antiseptic* value of the reagents tested depends upon their power to prevent the multiplication of putrefactive bacteria, and this is not necessarily connected with germicide potency. For some reagents which fail to kill these micro-organisms are, nevertheless, valuable antiseptics, *e. g.*, ferric sulphate and boracic acid.

Clinical experience has demonstrated the value of all the potent germicide reagents tested, in one or more of the diseases which there is the most reason to believe are due to the presence of pathogenic micro-organisms in the *primæ viæ*, in the blood, or in the tissues, *e. g.*, intermittent fever, typhoid fever, dysentery, erysipelas, syphilis, etc. The "germ theory" as to the causation of these diseases, receives, therefore, very strong support from modern therapeutics. But our experiments do not justify the belief that any one of the reagents tested can be administered as a *specific* in germ diseases generally. This also accords with the results of clinical experience, and makes it possible to believe that the specific, self-limited diseases are also "germ" diseases.

For if any germicide agent could be administered in sufficient quantity to insure the destruction of all parasitic organisms within the living body, it would evidently be a *specific* for all diseases of this character and its failure to arrest the progress of any one of these *hypothetical* germ diseases would be very good evidence of the unsoundness of the hypothesis.

ARTICLE II.

ON THE IMPORTANCE OF THE THOROUGH DISINFECTION OF THE STOOLS IN ENTERIC FEVER.

By JAMES C. WILSON, M.D., Physician to the Hospital of the Jefferson Medical College, in Philadelphia.

THE importance of the thorough disinfection of the stools in enteric fever is, to those who believe in it at all, so great and its practical results in the control of the extension of the disease are so manifest and direct, that it will doubtless appear to such persons a superfluous labour to discuss the matter anew. I do not hesitate, however, to incur the criticism of needless writing upon a subject so familiar to many medical men actively engaged in the daily practice of their profession, for the reason that I observe that there are quite as many others to whom the subject appears to have no importance whatever. These latter, either do not believe in the necessity of the disinfection of enteric fever stools, or else they regard it as of so slight moment that it matters not practically whether it be attended to or not, or finally whilst professing to recognize its importance they adopt in practice imperfect, or incomplete, measures to accomplish it. I believe it to be the exception to the rule, rather than the rule, both in private practice and in hospitals, to systematically and thoroughly disinfect every stool, even in well-characterized cases of enteric fever. The cases in which, upon inquiry, I have found such a rule carried into effect, have been conspicuously few. Even those practitioners who fully realize the dangers attendant upon its neglect are not rarely prevented by circumstances from accomplishing all that they consider necessary. This may happen, for example, in imperfectly developed or atypical cases that are not easily recognized until well advanced, or in cases of true relapse not recognized because of the imperfect account of the primary sickness given by the patient or his friend; or, and this often occurs, by reason of the neglect of the attendants, who are slow to understand the danger of treating the stools in this disease with indifference, especially when they cherish the opinion that they, because they have nursed many cases of fever, know a good deal about it.

Liebermeister has well said that "prophylactic measures will be effective just in proportion to the strength of our belief in the material nature of the typhoid poison, and in the possibility of destroying it, or preventing its spread." And he adds that, "here, as elsewhere in therapeutics, half-way measures, such as are likely to be employed by those who have but little faith in their efficacy, yield not half-way results, but no results at all." For my own part, after some observation and much careful consideration of the matter, I confidently believe that it is not only possible to greatly restrict enteric fever in its prevalence, but that, as has been suggested by Flint, it is also possible in the course of time to get rid of it

altogether. This statement is made with a full knowledge of the fact that this disease has a more extensive geographical distribution than any other zymotic disease whatever, and that it is not only at the present time endemic in almost every quarter of the globe, but that it is also the most common of the endemic infectious diseases in the countries where it prevails.

A growing knowledge of the habits of the exciting cause of enteric fever and of the methods by which the disease is propagated warrants this belief. It is certainly not more chimerical than would have been such a hope in the beginning of the seventeenth century, in regard to the plague; yet in little more than a century that disease had disappeared from Western Europe; nor than such a belief concerning smallpox in 1717, when Lady Wortley Montagu caused her son to be inoculated; yet to-day smallpox exists in civilized countries only by the neglect of the known means of its control. Could the surgeons of the Napoleonic campaigns have dared to predict that the greatest armies of modern history, both in Europe and America, would almost wholly escape the ravages of typhus? What an unsparing quarantine did with the plague in Europe; what vaccination has accomplished in the control of smallpox; what efficient sanitary regulations have brought to pass in preventing typhus fever in great armies—an energetic prophylaxis will assuredly accomplish with the great fever of the present.

Such a prophylaxis is in theory within reach; its practical realisation depends upon the energy and steadfastness with which measures for the destruction of the true cause of the disease and the prevention of the spread of that cause are carried out. These measures are to be directly deduced from a consideration of knowledge concerning the causation of enteric fever, now so familiar as to be embraced by the term "popular." They belong to the general subject of public hygiene, and are of sufficient importance to demand the unremitting attention of all local and general sanitary organizations; for enteric fever destroys more lives that could be saved than any other acute disease whatever. They are, moreover, largely within the personal control of the physicians of every community. It is a duty of the doctor, too often overlooked, to see to it, that no preventable new case of disease arise by direct or indirect contagion from any patient under his care. In enteric fever, we have to do with a disease in which this is wholly possible. Our efforts to prevent further cases arising from the original source of infection may be often in vain, but the spread of the disease from any given patient is always, and absolutely, within our control. The cause of the disease cannot only be definitely and wholly destroyed, but this can be accomplished with certainty before it has acquired the power of infection.

The one efficient measure that includes all others, is the proper treatment of the dejections.

Up to the present time the exciting cause of enteric fever has eluded

the attempts that have been made to demonstrate its nature. It is surely a micro-organism. Upon no other hypothesis can the known facts of the history of this and most of the other infectious diseases be explained. There is, moreover, abundant warrant for such a conclusion in the analogy of certain other diseases, notably anthrax and relapsing or spirillum fever. As it is, we are apparently upon the eve of more definite knowledge than has yet been attained. In 1880 was made the now familiar announcement of Eberth and Klebs, that they had discovered organisms in the tissues and fluids of patients dead of typhoid, that were not met with in like situations nor under like circumstances in the bodies of persons dead of other diseases. The researches of these observers were carried on separately and the announcement of the discovery of the organisms in question was made by each independently of the other, and nearly at the same time. There was a close correspondence in the descriptions, and each regarded the organisms described as essentially related to the cause of the disease.

A few months ago Maragliano, of Genoa, published an important note on the uniform occurrence of organisms in the blood of enteric fever patients during life. He found them both in the blood of the general circulation, and in that of the spleen, the latter being obtained by means of a hypodermic syringe the needle of which was passed through the abdominal wall into the substance of the organ. In the developed disease there are present in the blood isolated and grouped spherical bodies of a delicate contour, apparently homogeneous, resembling micrococci. Similar bodies were also found in the blood from the spleen, together with delicately outlined rod-shapen bodies corresponding in all particulars with those described by Eberth and Klebs. These bodies diminished in numbers as convalescence progressed, and none or very few were discovered in the blood of patients after large doses of quinine. By the method of fractional culture these organisms were reproduced in large numbers. Maragliano expresses no opinion as to their relation to the disease.

These observations are very suggestive. They are nevertheless inconclusive. Although the organisms described may be cultivated, there is nothing to show that either the resulting product or the blood itself is capable of giving rise to the disease in suitable subjects, as has been shown to be the case by the experiments of Pasteur with anthrax and chicken cholera, and by those of H. Vandyke Carter, at Bombay, in producing relapsing fever in monkeys by inoculation.[1]

[1] Dr. Almquist, of Stockholm, who has been working in this field, has cultivated bacteria taken from the blood of an enteric fever patient on the eleventh day, and succeeded in producing a series of generations. From the second generation he succeeded in inoculating a dog with the following result: the animal was hardly ill, but on the fifteenth day the Peyer's patches were found to be much swollen, and to contain bacteria, which were regarded as characteristic.—See *Med. Times and Gazette*, September 23, 1882.

It is also stated that M. Pasteur has succeeded in isolating the microbe of typhoid fever.—*Annales d'Hygiene publique*, September, 1882.

The difficulties in the way of the experimental investigation of this subject relate first to the almost complete absence of susceptibility to enteric fever on the part of the lower animals, and secondly, to the clinical fact that the stools do not possess at once upon being voided the power of infection, but only acquire it after undergoing certain altogether unknown changes outside the body.

Although the nature of the germ that gives rise to enteric fever is unknown, many facts in its natural history are established by abundant proof. Of these, the following have a direct bearing upon the subject of this paper:—

1. It is invariably derived from a previous case of enteric fever.

2. It is eliminated with the fecal discharges.

3. It is not capable of producing enteric fever at once in susceptible persons exposed to it, but must undergo changes outside the body before it acquires this power.

4. It retains its activity in favourable situations for a lengthened period, the requirements to this end being decomposing animal matter, especially fecal discharges, and moisture.

5. In such situations it is capable of reproducing itself.

These are the facts which indicate with singular directness the true measures necessary to prevent the spread of the disease, the efficient prophylaxis. These measures belong, for the most part, as I have said, to popular knowledge, and are beginning to be widely understood. That they fail of general acceptance is to be explained by two things: First, incredible as it is in the face of the accumulated knowledge upon the subject, there are still many persons regarded as professionally qualified to speak with authority upon such matters; and what is more, regarding themselves as qualified to do so, who look upon the germ theory of the infectious diseases as purely hypothetical, and who hold firmly to the view that typhoid fever, which they are inclined to consider a sort of "low nervous fever," may be caused by fear, sorrow, care, great fatigue, and so on, and therefore regard all measures of prophylaxis based upon the germ theory as a working hypothesis as vain.

Second, the pythogenic theory of the origin of enteric fever, introduced by Murchison and ingeniously defended by him and his followers, still holds its sway in the minds of many practitioners and teachers. The arguments in favour of this view and those against it are too familiar to detain us here. To Dr. William Budd, of Bristol, is due the credit of having first clearly pointed out and conclusively established the fact that no amount of filth of any kind can give rise to enteric fever in the absence of a previous case, or the dejections or soiled linen of a previous case. To turn back to his papers, in the light of our present definite knowledge of the specific cause of certain fevers, and especially with our present knowledge of the cause of relapsing fever, and read them as they appeared in *The Lancet*,

at intervals between 1856 and 1860, has a curious effect upon the mind of the student of medical history. With all the work done since they appeared but little has been added to the sum of his information upon the subject of the propagation of the disease. It was he who spoke of the sewer as "a continuation of the diseased intestine." He abounds in strong expressions, happy illustrations and an impressive earnestness. That it has occasionally been impossible to trace the mode of conveyance of the "typhoid poison" in instances of the disease that have occurred in communities previously free from it, constitutes a very feeble argument against the view of the continuous propagation of the disease. It is easy to conceive of the unsuspected transportation of colonies of micro-organisms in many ways; not difficult to understand the occurrence of cases of enteric fever that cannot be traced, if the germs which occasion it are capable of a prolonged existence outside the body, and of this there is abundant and conclusive proof.

One thing Budd did not understand. He failed to recognize the fact that the stools are not infectious when voided, but must undergo changes which require a certain, though not very long, time before they are capable of giving rise to new cases. The failure to understand this has proved a stumbling-block alike to those who have regarded enteric fever as contagious, and those who have held to the opposite view. Both views are true. It is not directly but indirectly contagious. Cases are now and then observed which are at first sight apparently due to direct contagion, but which upon closer consideration are found to have been caused by the transmission of the diseases by indirect means.

Dr. Cayley, in his Croonian Lectures for 1880, relates the particulars of such a case:—

"A boy was admitted into the Middlesex Hospital on March 27th, suffering from a very severe attack of typhoid. For several days he lay in an unconscious condition, and during this time he had very profuse diarrhœa—twelve to twenty liquid motions daily, which were for the most part passed in bed.

"In the next bed was a boy, aged six, who had been admitted on April 16th, with acute renal dropsy and bloody urine. He was kept strictly confined to bed, and never got up to go to the water-closet, down which the motions of the typhoid were thrown.

"On May 11th, when he was convalescing, the dropsy having disappeared, and the albumen much diminished, he was seized by typhoid fever, and passed through a moderately severe attack, with a small-marked rash and characteristic symptoms."

I have encountered a similar case: A man aged 20, was admitted to the hospital of the Jefferson Medical College, 28th October, 1881, with symptoms of subacute rheumatism, affecting several joints, and most severely the knees. A few days after admission, it was discovered that he was suffering from a purulent urethral discharge. The joint-pains which improved at first, afterwards proved stubborn; an iritis developed; there was complete loss of appetite, and great mental depression. In consequence of pain and inability to take food the patient fell into a state of great debility. He was, however, free from fever. When he had been

in the ward more than four weeks the temperature rose and diarrhœa set in. In the course of a few days he became delirious, and some rose-coloured spots appeared. Death occurred six weeks after the patient's admission, and the necropsy disclosed characteristic typhoid infiltration of Peyer's patches, and the solitary glands with beginning ulceration.

In the next bed but one to that occupied by this patient, was a man suffering from relapse of enteric fever, whose illness had been greatly prolonged, and who, during the greater part of the time from the admission of the patient spoken of till his death, had copious diarrhœa and was only feebly conscious, so that despite the vigilance of the attendants, his bed and his person were frequently soiled with the discharges.

Cases of this kind are, however, rare. The attendants who wait upon the sick, and even remove and empty the vessels, the medical men, who are occasionally obliged to inspect the stools, and the patients in adjoining beds, who are of necessity exposed to the effluvium from the recent stools, as a rule, to which there are few exceptions, escape infection. When such exceptions occur, it is usually possible to trace the infection, as in the above cases, to exposure to the emanations from discharges that, soiling the linen, or soaking into the mattresses or otherwise retained, have undergone the changes of decomposition outside the body of the patients. Under ordinary circumstances the new cases that occur upon the importation of the disease into hospitals are not apt to arise among those persons immediately surrounding the patients; but rather if there be defects in the drainage, among others at a distance. The changes by which the dejections acquire this power of infection take place with greatest activity in drains, privies, and upon ground saturated with organic substances where the dejections are collected together.

We encounter at this point a question of the greatest practical importance. It is this: Within what time do the stools, innocuous when voided, develop their infecting properties? Definite facts upon which a positive reply to this question could be based are wanting. The time is, however, in all probability brief. Dr. Cayley states that in the Middlesex Hospital, it was formerly the custom to keep the stools of cases of enteric fever, which the physicians wished to inspect, in pans which were kept in the water-closets of the wards. The time during which these stools were kept rarely exceeded twelve hours; nevertheless several instances occurred in which the patients using these closets contracted the disease. If these reserved stools were the cause of the infection, the period within which the contagious properties became developed in them could not have been longer than twelve hours.

That the soiled linen, which when fresh may be handled by the attendants with impunity, speedily becomes capable of occasioning the disease, is shown by the frequency with which washerwomen suffer, for articles of this kind are usually sent to be washed without great loss of time. This manner of infection is attested by many unquestionable observations. That related by Dr. Cayley is very striking. It took place at Calne:—

"A laundress occupied the middle one of a row of three houses supplied by one well, into which the slop of the laundress's house leaked. She on one occasion received the linen soiled by the discharges of a case of typhoid fever, and after fourteen days cases occurred in all three houses."

Dr. Budd's argument for the contagious character of enteric fever would have been unassailable if he had understood that the "special condition" of the communicability of the disease is the lapse of a few hours. At one point he says:—

"To teach . . . . that the disease is not contagious, because the immediate attendants on the sick escape it, ... is much the same as to argue that because the next successors of the tuft of rushes that overhangs yonder river do not spring up immediately around their parent, the spores it has committed to the stream are sterile, and that it is not in the nature of rushes to multiply at all."

If the spores, instead of floating away to distant points, remain where they fall long enough to germinate, the next successors will be close at hand. The element of time is now known to be the "special condition." It is, therefore, impossible to overrate the importance of prompt measures to render the stools inert through disinfection by the use of "powerful chemical agents," and their removal to localities in which they are little likely to do harm. This is no new suggestion.

The following plan was suggested by Dr. Budd, who, from the time he adopted this method of prevention (till the publication of the paper referred to) met with only one instance, where it was used from the first, in which the disease spread beyond the individual first attacked, while before he adopted it, it was not an uncommon thing for him to see several members of a family take the disease, one after another, even in airy and well-appointed houses:[1]—

1. "That for the future all the discharges from the fever patient should be received on their issue from the body into vessels containing a concentrated solution of chloride of zinc.
2. "That all tainted bed or body-linen should, immediately on its removal, be placed in water strongly impregnated with the same agent.
3. "That the water-closets should be flooded several times a day with it, and that some chloride of lime should also be placed there, to serve as a source of chlorine in the gaseous form.

"And, lastly, and by way of further precaution, that so long as the fever lasted, the water-closets should be used exclusively as a receptacle for the discharges from the sick."

Liebermeister uses a porcelain bedpan, the bottom of which is strewn with sulphate of iron each time before being used. Immediately after the passage, crude muriatic acid is poured over the fecal mass in considerable quantities—as much as one-third to one-half of the amount of the discharges being used. He also advises that, when practicable, the contents of the bedpan should be emptied into trenches dug anew at short periods,

[1] The Fever at the Clergy Orphan Asylum. Lancet, Dec. 6, 1856.

and carefully filled up; care being taken that they are located at a distance from the source of water supply.[1]

Except in rural districts this is of course impossible, and the dejections must be emptied into the ordinary water-closets or privy-vaults.

Flint directs that carbolic acid in the proportion of one part to forty of water should be at once used for the purpose of disinfecting the stools. If the odour from this disinfective agent be objectionable, a concentrated solution of sulphate of iron may be substituted, of which half a pint may be poured upon each dejection, or a mixture of these two substances may be used.[2]

Bartholow says: "The dejections of a typhoid patient should be at once disinfected by a strong solution of sulphate of iron or chloride of zinc."[3] It has also been suggested that the stools be mixed with sawdust and burned.

Like rules are laid down in most of the modern text-books, with more or less emphasis, according to the strength of the belief of the respective authors "in the material nature of the typhoid poison, and the practicability of destroying it or preventing its spread."

From the time that enteric fever first assumed place as a substantive disease, differing pathologically and clinically from the others of the group of continuous fevers, two opinions were held, both in Great Britain and on the continent, concerning its contagiousness. It is worthy of note that the physicians of large cities, centres of medical authority, for the most part denied that the disease was communicable from the sick to the well; whilst those practising in the rural districts maintained its contagiousness, and from time to time published narratives of local outbreaks not otherwise explicable. Bretonneau, Chomel, Louis, all, however, inclined to the opinion that the disease was communicable. Trousseau, after citing a series of instances, declares that "the contagious nature of the disease is incontestable," and suggests, as an explanation of the fact that patients rarely contract the disease in hospital wards from others who have it, that the individuals who thus escape may have been rendered insusceptible by an attack at a former time. He adds the more general explanation that the energy of the *contagium* is less when cases occur sporadically than when typhoid fever prevails as an epidemic. These explanations are wholly inadequate, and have been set at naught by the facts brought to light by Budd.

Those who, prior to the time of the last-named observer, advocated the contagiousness of the disease, could suggest no measures of prophylaxis other than those employed to prevent the spread of the other contagious diseases, such as isolation, fumigation of the apartment, clothing, and so on. Measures such as these were seen to be wholly unnecessary when,

[1] Ziemssen's Cyclopædia of Medicine.
[2] Clinical Medicine.
[3] Practice of Medicine.

by happy accident, the stools were well and quickly gotten rid of, and wholly useless when, by an unfortunate mischance, as often befell, especially in country places, the stools were treated with indifference. Thus it came to pass that a deplorable and dangerous uncertainty prevailed as to whether or not the disease was communicable. This uncertainty is now for the most part settled, though it would appear that a fear lest enteric fever may be directly contagious still exists in the minds of the Hygienic Council of the French Academy of Medicine, who have recently drawn up the following rules, to be observed "when the presence of typhoid fever is recognized":—

"1. *Isolation.*—The patient should be isolated as far as possible from the other inhabitants of the house; if complete isolation be not possible, the patient should be taken to a hospital. If the patient remain in his home, only those persons who minister to his wants should have access to his chamber, while all children should be rigidly excluded. Nurses should wash in carbolized water, one per cent.

"2. *Aeration of the Chamber.*—A room should be selected which can be readily aired. The hangings, curtains, and carpets should be removed, and the bed placed in the centre of the room.

"3. *Disinfection of the Evacuations.*—All the ejecta of the patient, before being thrown out, should be thoroughly disinfected with a solution of chloride of zinc, 20 per cent. The privies into which the evacuations are thrown should also be flushed with this solution.

"4. *Disinfection of Clothing.*—All the patient's body- and bed-clothing, before being removed from the room, should be plunged into a solution of carbolic acid, 5 per cent., and then immediately washed.

"5. *Disinfection of the Room.*—After the death or cure of the patient, charcoal should be burnt in the room, with sublimed sulphur, and the chamber should then be closed for twenty-four hours. The chamber should then be washed with carbolized water, and not reoccupied until it has been freely aired for at least a week."

If enteric fever be not directly but only indirectly communicable, and that by means of the dejections, several of these rules are unnecessary. It is with the stools, the vessels into which they are voided, the body-linen and bed-linen soiled with the discharges, and these alone, that we must concern ourselves in the matter of disinfection to prevent the spread of the disease. Plenty of fresh air, as little furniture as possible, no visitors or others in the room except those who take care of the patient, scrupulous cleanliness in all respects, are points to be insisted upon in the management of every case; but we must not lose sight of the real danger, nor by too great diligence in matters not essential, suffer our attention to be diverted from the one needful thing.

Every-day experience, both in hospital and general practice, shows how slight is the danger of the communication of the disease where the discharges are properly disposed of. This, and not, as Trousseau supposed, the greater energy of the cause, is the explanation of the comparative rarity of local epidemics in cities, their frequency in small villages and rural districts. In cities the discharges are, as a rule, promptly thrown into drains and more or less completely swept away; in

the country they are apt to be deposited near the dwelling, and not only are they thus kept, but they are too often kept under circumstances the most favourable to the development of their infecting principles.

The literature of the subject abounds with lamentable illustrations of the dangers of the neglect to *completely disinfect* the stools when cases occur in the country, or under circumstances where it is impossible, through the lack of drainage, to effectually remove the dejections to a distance. But what is happening every day in cities in consequence of the neglect of disinfection? Is it enough that no new cases arise in the immediate vicinity of the patient? The drainage of our house is perfect, and by good fortune no particle of the treacherous filth is anywhere retained. Are we therefore to be unmindful of our neighbour, whose house-drains are far less safe than ours, imperfectly or perhaps not at all trapped and ventilated? Or of the dangers of the sewer inlets, or at some distant leak, where the sewage, soaking into the surrounding soil, may befoul a source of water supply, or where it only awaits the disturbances necessary for alterations or repairs to occasion fresh cases? Or, lastly, dare we ignore the fact that the crews of ships, lying in the rivers and harbours into which our great systems of sewers empty, contribute a steady supply of enteric fever cases of the most severe type to our hospitals? It occasionally happens, perhaps more frequently than we suspect, that the best house-drainage attainable fails of its object in some particular. Somewhere about the closet, in some joint or crevice, perhaps at the junction of the wood-work and the porcelain, an unobserved fleck of feces—the merest splash from the emptied bedpan—lodges and stays, retaining indefinitely or even affording a nidus for the development of its disease-producing microbes. In this way, when not in more obvious and coarser ways, such as choked soil-pipes, or leaks, or bad traps, or the dangerous old-fashioned pan closet, certain houses, a case once having occurred in them, become in a literal sense homes of enteric fever. There are typhoid houses, just as there are diphtheria houses, and for the same reasons.

Examples of such perennial centres of infection are far from rare. Murchison, among others, speaks of houses of this kind. I have recently met with several cases apparently due to continuous house-infection. I anticipate the objection that individuals dwelling in the same house may contract enteric fever at indefinite intervals as a mere coincidence, the infection being not continuous, but derived from altogether different sources. The *probability* of continuous house-infection is sufficiently strong for the purposes of the argument.

In a family of eight children, living in a large, well-built house, a son had enteric fever, and occupied, during his sickness and afterward, a room communicating with a bath-room in which there was also a water-closet. Enteric fever had not previously occurred in the family nor in the house. A year after his recovery the son gave up the room to a sister, who shortly afterwards contracted the disease. Thereupon the drainage of the

bath-room was overhauled, "found defective," and rearranged. Nevertheless another daughter, who after several months came to share the room in question with the sister who had been ill, after repeated attacks of diarrhœa, had severe enteric fever.

Here the bath-room communicated directly with the sleeping-room; but in the two cases that follow an arrangement of the water-closet commonly looked upon as affording unusual security existed. At this point it may be stated that with properly trapped and ventilated soil-pipes, and a good supply of water the dangers from the sewer as to enteric fever are slight. It is from the house-side of the trap and the adjacent construction that, a case once having occurred, danger is to be feared.

A gentleman occupied a large airy room on the third floor of a spacious corner house in the heart of the city. In the autumn of 1881, he fell ill of enteric fever. The stools were thrown into a water-closet in the bath-room on the same floor. This bath-room does not communicate with any of the sleeping rooms, but being built in a sort of annex, is reached by a short hallway. The water-supply is good and the plumbing modern and in order. This year another gentleman, not having been exposed to any other traceable infection, and spending the most of his time in this house, using also this bath-room, has suffered, as I learn from his medical attendant, from an anomalous continued fever of considerable severity and long duration.

And another, yet more striking case:—

A gentleman of means, 38 years old, bought one of a row of houses in the course of building in a good neighbourhood. Desirous of securing the best drainage, he made such arrangements with the contractor in charge of the work as permitted him to take personal charge of the plumber's work in his house. Neither trouble nor expense was spared in the pursuit of this object. The details of the work were in accordance with the suggestions of an expert of repute. The bath-room communicating with his sleeping-room was provided with a tub and stationary washbasin only, the water-closet being in the back buildings and connected with the sewer by a separate system of pipes. A few months after moving into this house, its owner contracted enteric fever, of which he died in consequence of perforation of the bowel. Eighteen months later his widow, who had continued to occupy the house, suffered from an attack of enteric fever with characteristic symptoms.

Much more disastrous was the next instance:—

A family, consisting of a man and his wife, one daughter and several sons, all grown up, came to eastern Pennsylvania and bought an extensive tract of unimproved land upon the southern slope of a mountain of moderate elevation. Upon a portion of this land they built a large frame house as a general boarding-house and water-cure establishment. The nearest dwellings were a mile away, and the water supply, which was abundant for all purposes, was drawn from a spring some distance above the house on the hillside. The plumbing was arranged with judgment, and the surroundings were salubrious. The second year there came to the house in September, as a boarder, a lady, who, within a few days of her arrival, fell ill of enteric fever, of which she died. In the course of

a few weeks the daughter and one of the sons had fever, and were sick a long time. The following summer two or three cases of fever occurred among the boarders. This reappearance of the disease led the owner to have his plumbing and drains examined by a competent person, who found no stoppage and no leaks. Nevertheless, such changes were made as would obviate, it was thought, every possible risk of infection from this source in the future. The next summer, four persons of whom I have knowledge contracted fever after some weeks' sojourn in this house. One of these died, and another, who was taken sick a few days before his return to Philadelphia, was under my care for six weeks with distinctly marked, mild enteric fever.

Efforts to trace the history of families, and of houses in which enteric fever has occurred, have, in my own practice, brought to light the above facts in the course of a few months. I am confident that similar investigations in a wider field would disclose a much more general evidence of continuous house-infection than is commonly suspected to exist. The limited number of cases, and the length of the intervals at which they occur are to be explained by the smallness of the amount of the infecting principle, rendering necessary, in all probability, an exposure of peculiar directness, or by the fact that a certain proportion of those exposed have been rendered insusceptible by a previous attack; or, finally, it is in a high degree probable that prolonged, incomplete exposure to the infecting principle of enteric fever may bring about in the individual a certain degree of tolerance—a sort of acclimation to an atmosphere sparsely charged with that poison.

To state the subject concisely, when a case of enteric fever arises from any source of infection whatever, there is great danger that it in turn will become the source of an indefinite number of other cases, a new focus of infection. The disease being propagated by means of the alvine discharges, two sets of persons are endangered by any particular case, those in the immediate vicinity, and those at a distance. The relative danger of near and remote infection is in rural and urban communities reversed in consequence of the different customs prevailing in each as regards the usual disposition of fecal discharges. In rural districts persons near at hand are particularly exposed, hence the frequency of local epidemics, whilst by the chance contamination of sources of water-supply, springs, running streams, or the transportation of dung for use as manure, persons at a distance may also become exposed, though much less frequently. In cities, however, the discharges being conveyed away by means of undergound sewers, subject more commonly those at a distance to the danger of infection. Nevertheless, we have seen that continuous house-infection may occur from the accidental retention of minute collections of the infecting principle on the house-side of the trap in the best attainable water-closets and sewer systems.

The importance of simple and effective sewerage, and of thoroughness

in every detail of house-drainage, is to be urged at all hands with unremitting earnestness. But with reference to enteric fever safety does not lie in this direction. The danger to those near by and to those remote may be reduced to a minimum without regard to the imperfections inherent to the best plumber's work, by the systematic and thorough disinfection of the stools. When all the stools are completely disinfected immediately upon being voided, the danger that any given case will give rise to new cases becomes nil. To accomplish all that is possible in preventing the spread of enteric fever, the plan of complete and immediate disinfection must be systematically applied not only to the stools of the established cases, but also to those of cases that are beginning, that is to say, not only to the recognized but also to the suspected cases. In this way, and only in this way, can enteric fever be "stamped out."

The method of disinfection and the agent employed are of the utmost importance. There is little doubt that many of the measures commonly employed for this purpose are altogether inoperative; the disinfecting (germicide) power of many of the agents in common use is certainly feeble.

Koch has experimentally tested the ordinary disinfectants with the object of ascertaining (1), their respective power of destroying the resting-spores of bacilli, which are the most difficult of all forms of life to destroy; (2) their influence upon more easily destructible organisms, yeast, bacteria, bacilli, and micrococci; (3) their relative power of arresting the development of micro-organisms in alimentary beverages.[1]

He found that carbolic acid did not prove itself a sovereign disinfectant. It is worthy of note that solutions of this agent in oil and in alcohol are without effect in destroying the spores and bacilli of splenic fever. The same was the case with salicylic acid and thymol. Sulphurous acid also proved a very uncertain disinfectant for practical purposes. Zinc chloride, even in 5 per cent. solution, failed within a month to weaken the developing power of splenic fever spores.

Koch concludes that the only certain disinfectants are chlorine, bromine, and corrosive sublimate.

The results of these elaborate experiments may be found in the number of this Journal for October, 1882, page 581.

A series of experiments conducted by Arloing, Cornevin, and Thomas, at Lyons, with the object of testing the influence of various disinfecting agents upon morbific germs, resulted in placing corrosive sublimate at the head of the list of the efficient agents. The infecting principle of symptomatic anthrax was used, and a solution of 1 to 5000 was found to be capable of destroying the germs in the dried state.[2]

These results are in accordance with well-known facts—facts apparently

[1] Milttheil. der Kaiser Gesundh. 1881, Bd. X. Report der Analyt. Chemie, 1882, No. 1.

[2] Lyons Médicale. See also Abstract in Am. Journal Medical Sciences, October, 1882, p. 582.

better known, however, in the arts than in medicine. For example, solutions of corrosive sublimate are constantly used in households to destroy vermin, and it is well known that such solutions are employed by the taxidermists and furriers for the preservation of skins. Less known, perhaps, is their use by carriage-builders and hatters to prevent the development of moths in woollen fabrics. Corrosive sublimate is, however, much employed in the treatment of certain of the parasitic skin affections. It possesses also, to a high degree, the property of retarding putrefaction. "Animal matters, immersed in its solution, shrink, acquire firmness, assume a white colour, and become imputrescible. On account of this property it is usefully employed for preserving anatomical preparations." (Wood and Bache.)

I have satisfied myself by repeated experiment, that even weak solutions of corrosive sublimate possess the power of deodorizing putrescent animal substances to a degree not shown by most other substances in common use for the purpose, and I have of late used a solution of this agent 1 to 15000 to 1 to 5000 in washing out the chest cavity in cases of empyema with the effect of rapidly reducing the amount of purulent discharge.

In this preparation of mercury we possess at a very moderate cost a disinfectant of the highest efficiency. It is free from colour and odour, and in every respect convenient of employment. It is, furthermore, not only sure, but also rapid in its action. On theoretical and practical grounds alike, it is the disinfectant to be preferred for use in preventing the spread of enteric fever.

In practice 8.00 grammes (℥ij) of corrosive sublimate, taken to the house of the patient by the physician himself to avoid all risk of accidental poisoning, is to be dissolved in a gallon of water in a large bottle or demijohn. This vessel, properly labelled, is to be given in charge of the nurse. The strength of the solution is about 1 to 500 parts, and the danger of accidental poisoning is surely no greater than that attending a similar use of strong solutions of zinc chloride, carbolic acid, or any of the crude mineral acids.

Immediately after the bedpan has been used, a sufficient quantity of this solution should be poured over its fecal contents to cover them. This may be conveniently accomplished when the amount of the evacuation is small by inclining the pan so that its contents gravitate to the large end. If there be hard lumps, it is advisable to break them up in the solution. The pan should not be emptied for fifteen minutes. When using the water-closet the handle of the valve must be held up sufficiently long to thoroughly flush the trap, and a small quantity of the solution afterwards poured into the basin of the closet and allowed to remain. A small quantity is also to be kept in the bedpan in the intervals of its use.

The linen should be sprinkled with the solution before being sent to the

laundry, and portions stained with the discharges must be thoroughly wet with it, or even allowed to soak a short time. As an additional precaution, the clothing should be boiled for some hours, and subjected to thorough rinsing (in running water whenever practicable) before being handled by the washerwoman.

ARTICLE III.

CASES OF "MUSHROOM POISONING." By JAS. D. TRASK, M.D., of Astoria, New York.

DURING an absence from home, last autumn, two reports of cases of death from eating poisonous fungi having met my eye in the columns of a country paper, I determined to obtain all the particulars possible in connection with them.

The first occurred in the family of Mr. G. E. Everett, residing near Modena, Ulster Co., N. Y., the family consisting of the father, mother, grandmother, daughter of fifteen, and a son aged thirteen. On visiting Modena the following particulars were obtained from Dr. Parker, who attended the family, and also from the surviving members:—

On the morning of Saturday, Sept. 23d, the father had gathered an edible mushroom (*Agaricus campestris*) from the grass before the door, which had been cooked by the grandmother, and tasted with great relish by several of the family. As the grandmother professed to be able to distinguish the wholesome from the poisonous, the father and son determined to gather a mess for dinner. A basketful was brought home, of which a considerable portion had been found in the woods. They were culled over by the grandmother, and, in what proved to be her absolute want of experience, she is believed even to have rejected some that were undoubtedly edible. They were served at dinner; those who had eaten the campestris in the morning, declaring that these had a different taste from it, the flavour being earthy and uninviting. Condiments were added to improve the taste. Not over a quart of the fungi was cooked. The wife ate not more than a *teaspoonful* of the *liquid*, the boy ate, perhaps, two fungi. At their evening meal, what had been left at noon was re-served and tasted by the father and grandmother and boy, but they found them still uninviting. The boy complained of malaise at supper time, and soon after going to bed was seized with vomiting and purging. At midnight the grandmother was attacked in the same manner, and by 2 A. M. the entire number was suffering from urgent vomiting, diarrhœa, and cramps, no one being able to render assistance to the rest, nor to go for help. About 5 A. M. the boy succeeded in reaching a house a quarter of a mile distant, and the doctor was sent for.

On the doctor's arrival he found the vomiting and purging almost incessant, accompanied by excessive burning in the stomach, cramps of the arms, legs, and walls of the abdomen. Nausea continued with the grandmother until Monday evening, a short time before her death, which occurred at 8 P. M.

There was with her, from the first, a tendency to collapse and oppression of breathing, requiring free employment of alcoholic stimulants. The vomiting and purging of the father continued, at prolonged intervals, until Tuesday noon. He suffered from a sense of prostration, which seemed disproportionate to the other symptoms. At this time hiccough occurred, which continued, at intervals, until the last. After cessation of vomiting extreme irritability of the stomach continued, permitting him to take blandest nourishment only in small quantities.

There was at no time tenderness over the epigastrium, or any part of the abdomen, only a sense of soreness after hiccough. There seemed to be no local evidence of gastritis, or of enteritis, beyond dejections of a deep green, offensive and mucous character. There was constipation for four days previous to death, loss of contractility of the bladder, requiring relief. For four days previous to death the temperature gradually sank to 97; the pulse at no time exceeded 90, was generally 86. As strength failed dulness of the mental faculties came on, and, during the last twenty-four hours, he was comatose. He died Oct. 6th, and was 44 years old.

Though Mrs. E. had partaken of an extremely small quantity of the soup only, her symptoms were as urgent as those of any of the family. She had, moreover, tenderness of the epigastrium, and scalding, acrid eructations, which were much relieved by the use of bismuth and soda. Convalescence with her commenced on the third or fourth day; and the recovery of the son and daughter was equally satisfactory.

The second instance occurred in the family of Mr. George Thorne, a farmer, living not far from Lake Mahopac, Westchester Co., N. Y.

The following particulars were kindly furnished by Dr. Edson Card, Jr., whom I visited at his residence at Lake Mahopac:—

The family of Mr. Thorne had recently taken back into their employment a female servant, who had lived with them some five years before, and who had then been in the habit of gathering and cooking mushrooms for them. Mr. T., congratulating himself on her return on this account, urged her to prepare a mess for the table, as she had formerly done. They sat down at their noon meal to the anticipated repast, Saturday, Sept. 16th. The husband and wife ate of the mushrooms, as did a peddler who happened to be present at their table. The peddler left immediately after dinner, and was heard of, some days afterward, as having been very ill at a place where he stayed overnight.

Mr. Thorne and his wife were seized about midnight with vomiting and purging and cramps, which were not very urgent, in the calves of the legs. Mr. T. had been subject, annually, to attacks of cholera morbus, and the true nature of the case did not occur to them till the following day. Dr. Card was not called till Sunday, at 3 P. M.

The doctor remained an hour, and gave twelve grains of ipecac, which had the effect of quieting the stomach.

Monday morning, purging still going on, Mr. T. fell into a state of collapse, and was hurried into bed. By the use of stimulants and heat, reaction was induced. At 1 P. M. he was restless, and complained of a sense of heat, while the surface was cold, and he died at 6.30 P. M. There was at no time tenderness of the epigastrium or abdomen on pressure, no retention or suppression of urine. There was constant thirst. The pulse small and frequent, and, during the last twenty-four hours, the mind was wandering, with a degree of stupor.

Mrs. Thorne was taken about the same time with her husband with similar symptoms. She had no vomiting or purging after Monday; on the contrary, her bowels were confined; lassitude ensued, and she had a protracted convalescence, with much nervous prostration.

There appeared in a late Pennsylvania paper an account of cases of poisoning from this source in the family of Mr. George Zimmerman, Centre Square, Montgomery Co., Penn., and I am indebted to the courtesy of Dr. S. C. Seiple, of that place, for the following particulars:—

He was called to the Zimmerman family on the morning of the 20th of Sept., 1882, about 7 o'clock. Mr. and Mrs. Z. and two servants, Charles and Mary Upright, were suffering from the effects of eating mushrooms on the previous evening, about five o'clock.

Toward morning they were successively seized with nausea, vomiting, and pain in the stomach, followed by purging. He observed no traces of mushrooms in the matters that were vomited, or that passed the bowels.

William Baker, another servant, who had collected the fungi, and, being very fond of them, had eaten a large amount, was not affected until towards evening. He was taken with symptoms similar to the rest, but the gastro-intestinal irritation came on sooner than with the others, and he was the first to die. His death took place on the 14th, about 11 A. M. Charles Upright died on the 25th, about 4 P. M. In the two fatal cases, and that of the little girl, Mary, there were bloody dejections, with great tenesmus, and, in the two fatal cases, somnolence, stupor, intermittent pulse, tympanitis, violent pain in the stomach, cold extremities, and livid skin.

At the first visit large draughts of lukewarm water were given, which gave some relief; afterward compound spirits of ether, with milk and brandy, and after the first day the diarrhœa and pain were controlled by opium suppositories. There was a constant and irresistible desire for ice, which was allowed sparingly, as "water is believed to be contra-indicated in muscarine-poisoning." The severe gastro-intestinal irritation was treated by a desertspoonful of olive oil every two or three hours: this in two cases "seemed to act like a charm." The pulse from 90 to 100 gradually rose to 150; temperature was below normal all the way through, but no exact record was kept.

The influence upon the nervous system was shown in depression of spirits and general anxiety. Dr. Seiple is inclined to attribute this in part to the direct poisoning influence of the fungi, from the fact that the nervous symptoms appeared very early. This was especially true in the case of Mrs. Z. This lady had no bloody dejections, and the irritability of the stomach and bowels entirely disappeared by the end of the week, but there were great nervous prostration and restlessness, which lasted at least four weeks.

A sister of the Uprights writes that the mushrooms eaten filled a small milk-pan, and were made into soup. Those first seized had violent vomiting, and suffered the most severe pains about the head, and had a burning sensation in the stomach, with fever. Mrs. Z. began to complain Wednesday morning at three o'clock, Mr. Z. about four, Mary U. at five, and Charlie about six. Baker felt no disturbing symptoms until Wednesday about dinner time. During Wednesday the sufferers at times seemed so far recovered as to be able to arise, but were instantly compelled to seek their beds again. Mrs. Z. and Charley were considered the worst.

Baker was 17 years old and Charley 16; both were strong, hearty boys. Baker went to bed when first seized, but got up in the afternoon, went to the barn and helped to do some of the night work; went to bed again, and with the exception of short periods remained there till his death. His suffering from thirst was intense.

October 24, 1874, I was called to see a man aged 72, a Scotchman by birth, suffering from the effects of eating supposed mushrooms. He was a stone-cutter by trade, and was employed in the Central Park, like "Old Mortality," to touch up defaced stone-work. In crossing the park to his work in the mornings his attention was attracted to a group of fungi under a tree, and he resolved if they should still be there on his return homewards in the evening he would gather them.

Unfortunately for him they had not been disturbed, and he secured them, in number about half a dozen. They were cooked for his breakfast on the following morning; their taste being bitter, the old man ate but one or two, and the daughter ate one. In the evening he returned home sick, suffering from vomiting and diarrhœa, which had come on soon after breakfast. About the time of his return the daughter was seized with vomiting, and continued to suffer till Saturday the 27th; on this day the father died. The vomiting and diarrhœa had not with him lasted over forty-eight hours, and he died from exhaustion which seemed to me to be disproportionate to the discharges.

The marked similarity of the symptoms in these various cases is of itself suggestive of identity of origin. The indications of gastro-intestinal irritation first appeared after an interval of nine to twelve or thirteen hours, and in one instance that proved fatal, the boy Baker, eighteen or nineteen hours. Vaillant states that in cases of poisoning from *Amanita phalloides*, symptoms do not appear until from twelve to fifteen hours. In every case there were indications of the operation of a depressing influence upon the nervous system, disproportionate to the diarrhœa. From a very exact description given to me personally by Mrs. Everett, a very intelligent person, of the appearance of the fungi eaten by her family, there can be no doubt in my mind that they were specimens of the *Amanita phalloides* or *A. verna*. These two species are often with difficulty distinguished from each other. Those eaten by her family were of a beautiful, ivory white throughout, with the stem four or five inches in length and bulbous at its lower extremity. It is from this latter characteristic that it is called by the French *A. bulbeux*. The symptoms in the Everett family correspond almost exactly with those in six cases of poisoning from the *A. bulbeux*, quoted in the *London Medical Gazette*, vol. xxv. p. 110, quoted from *Bulletin Méd. du Midi*, one of which was fatal.

I was not equally fortunate in securing an accurate description of the fungi eaten by the Thorne and Zimmerman families. When Dr. Card was called to the Thorne family, he had a basketful of fungi gathered from the same ground from which those cooked had been taken the day before. On presenting these for examination to a neighbour, who was familiar with the distinctive characteristics of the wholesome and poisonous mushrooms,

about one-half were rejected as poisonous. His distinction between the two was the colour of the gills, those of the poisonous being white. The shape of the stems was not noted. There can be no reasonable doubt that those rejected as poisonous belonged to one or the other of the above-named poisonous species. In the case of the Zimmerman family the means of identification are very imperfect. The boy Baker was accustomed to gathering mushrooms, and Mrs. Z. to preparing them for the table, and the family believe that those eaten "were genuine mushrooms, but were poisonous from age and the place where they grew, which was near a swampy part of the farm."

The Thorne family were equally confident as to what they ate, and for the same reasons, but in their case it is certain that at least one-half were poisonous.

This brings us to the important question, Is the common mushroom poisonous under any circumstances? By many this is believed to be true. Christison says that the *Agaricus campestris*, or common mushroom, is believed by some to be unsafe toward the close of the season, though he has not found them so after eating freely of them. Porcher, in an elaborate paper in vol. vii. of the *Transactions of the American Medical Association*, on the "Medical and Toxicological Properties of the Cryptogamous Plants of the United States," does not allude to a single case of poisoning by the common mushroom. The *London Medical Times*, vol. xxiv., 1851, gives the report of the death of two Belgian officers after eating mushrooms, coupled with the statement that the poison is contained in the *A. campestris* after a certain stage of growth. This is the only instance which I have been able to find reported of death attributed to the common mushroom, and no data are given by which the correctness of the opinion may be verified. They have been frequently eaten in an advanced stage by my own family; and it is asserted by connoisseurs that they are then of much finer flavour than in the earlier stages of development.

An article attributed to Prof. Ponfick, of Breslau, has recently been largely circulated in the newspapers, in which it is asserted that all common mushrooms are poisonous. In reference to this, it is sufficient to state that many varieties of fungi are eaten largely in Germany, which are rarely eaten in this country. The term mushroom, in this article of Prof. P., may embrace many varieties. If it referred to the *Agaricus campestris* it would be enough to point to its enormous consumption almost everywhere with almost absolute impunity. It is true, as Christison states, that on certain persons all mushrooms act more or less injuriously, and when taken in large quantity, and for a long period, may be deleterious to any one. Idiosyncrasy, as has been observed in the case of many other articles of food, as oysters, fruits, etc., will account for some of these cases.

Worthington G. Smith,[1] author of an excellent little treatise upon mushrooms and toad-stools, says:—

"He has known cows to be very fond of mushrooms, and a friend of his in the country more than once has seen his cows, in the morning, go from mushroom to mushroom until all were consumed. Sheep, squirrels, birds, and many other animals, commonly eat raw mushrooms and many other fungi."

In all the cases reported in this paper, there was a marked delay in the appearance of symptoms, but these were in all essentially the same, viz., vomiting and diarrhœa followed by prostration, accompanied in some with severe pain in the head. In no instance were there any symptoms of narcotic poisoning, at any rate in the earlier stages. All these cases conform in their general features to the cases of poisoning by *Amanita phalloides* reported by Mons. Pallois; and even in the case of the Zimmerman family, there are strong grounds for believing that some specimens of these must have been overlooked, as had happened in the Thorne family.

It is asserted by good authority, that when several members of a family have been poisoned by the same fungus, a portion have suffered from symptoms of narcotic poisoning, while others were affected with gastro-intestinal irritation alone, but that these two classes of symptoms may occur in the same patient. This is understood to be true of poisonous fungi in general. Worthington G. Smith gives a graphic account of his own experience after eating a poisonous fungus, the *Agaricus sinuatus*, which was found in the woods. Within a quarter of an hour he was overtaken with strange, nervous depression, swimming of the brain, and violent pains in the stomach; soon had great difficulty in standing, and all his senses appeared to be leaving him. Two friends who had lunched with him suffered precisely as he had done, but were attacked by violent vomiting, and after a few days they recovered. He, however, was fearfully purged, suffered from headache and swimming of the brain; and not until a fortnight did he recover from "loathing and lassitude," long and troubled sleep, and stiffness of the joints.

In the Everett family there were two cases of marked loss of power over the bladder, in one requiring a catheter.

In the cases of Mons. Pallois notable suppression of urine is mentioned.

According to Braconnot, quoted by Porcher, most fungi contain, 1st, fungin, which is the fleshy substance, a peculiar acid called fungic acid combined with potassa, and a sugar. 2d, two poisonous principles. One of these an acrid matter, which disappears when the plant is boiled, the other, more fixed, forms crystallizable salts with acids, which he found in the *Amanita muscaria*, and called Amanatine.

The term muscaria or muscarine has, within a few years, been applied

[1] Mushrooms and Toad-stools, how to distinguish easily the differences between Edible and Poisonous Fungi, with two large sheets. London, 1879.

to the poisonous principle of the Amanita muscaria or fly agaric. New interest has been imparted to it by its recent introduction into medicine, especially in ophthalmic practice.

Dr. Bartholow, in his Cartwright lectures, states that the general effects of muscaria are nausea, vomiting, diarrhœa, and severe colic, which are due to the tetanic contraction of the muscular layer of the bowels which it produces, and active delirium, characterized by rambling incoherence, and a somewhat pleasurable excitement, resembling the effects of alcoholic intoxication.

During the stages of delirium the pupil is contracted and the vision is dim, blurred, and probably double. In toxic doses the agent produces epileptiform seizures, trismus, loss of reflex irritability, and coma more or less profound, after the period of intoxication. Death takes place from failure of the heart. No antagonism could well be more exact than that between muscaria and atropia. Smith states that some of the effects of swallowing *A. muscaria* are the same as from intoxicating liquors, others similar to those of haschisch; it is thus used in Siberia. The urine becomes impregnated, and is itself made use of as a means of perpetuating and distributing the intoxicating principle. Notwithstanding this, its use sometimes proves fatal, as in the case of the Czar Alexis.

Cases of mushroom poisoning, so called, may be divided into two groups: the first embraces those instances in which poisonous fungi are gathered by mistake, either by themselves, as in the cases of the old Scotchman and the Everett family, or found growing in company with those that are edible, as in the case of the Thorne family. There can be no question that the *Amanita phalloides* and *A. verna*, and especially the former, are the varieties that are almost invariably thus mistaken. These are very common; specimens of them vary in the length and shape of the stems, but they can always be distinguished by the colour of their gills. It must be carefully borne in mind that while the under surface of these two poisonous varieties is always white, that of the edible campestris is always of pink of varying shade. In the preparation of mushrooms for the table great care ought to be exercised in scrutinizing every individual that has been gathered for food, and, if the colour of the gills is not satisfactory, such should be immediately rejected. If this precaution is taken, and they are gathered only from the open field and not from the woods, it seems impossible that any mistake can occur, or that any strictly poisonous effects can result.

We have already considered the question of the asserted poisonous properties of campestris when old. Though we believe that there is no reason for the idea that these become strictly poisonous, they probably are less easily digested, and consequently are more likely to create disturbance of the stomach and bowels.

The other group embraces those instances in which persons, from curiosity, caprice, incorrect information, and perhaps from necessity, have eaten poisonous fungi which bear no resemblance to the campestris, and which cannot possibly be mistaken for it. Many cases of fatal poisoning have arisen from eating these poisonous growths. Besides the campestris, there is a large group of edible fungi which may be made to serve as a very important contribution to our list of articles of food. One of these, the common puff-ball, Lycoperdon giganteus, in the *early stages* of its growth, while yet pure, white, and tender, when sliced and fried in butter, rivals the most delicious omelet, and in the collection of these *no* mistake can possibly be made. Beyond this familiar variety, however, no one should venture, without being previously instructed by some one thoroughly familiar with the strange varieties, unless he is prepared to enter upon a series of experiments upon himself to test their wholesomeness. There is no simple test by which the poisonous can be distinguished from the wholesome, and the precautions here mentioned will be neglected by the foolhardy alone.

Not a summer passes that cases similar to these above related do not appear in our local papers. They excite but little interest, and I have been unable to find any hitherto published record of an attempt to identify the species. Our cases, with the exception of the last, occurred within a radius of less than seventy-five miles, in one season; they embrace thirteen individuals, of whom five died.

Statistics of the number of individuals poisoned by this means, and the mortality of the accident throughout the United States would be of great interest. There is reason to believe that the number of those who die every year from this cause is very considerable.

The value of edible fungi as a source of food supply is but little appreciated in this country. It is stated on the authority of the late Rev. Dr. Curtis of North Carolina, the eminent mycologist, that this form of vegetation abounds in the Southern States, and could be made to contribute largely to the support of human life as an article of food. In every part of the country the campestris is eagerly sought for; and could some means be devised for imparting information on the subject to the public, there are several varieties which could be gathered, that are not only nutritious, but quite worthy of being classed among the luxuries of the table.

Those desirous of becoming acquainted with this most interesting class of plants will find what they need in Cook's British Fungi, a duodecimo, and in Smith's Plates, coloured sheets, representing the edible and the poisonous varieties, with a descriptive manual.

ARTICLE IV.

TRIGEMINAL NEURALGIA RELIEVED BY LIGATION OF THE COMMON CAROTID ARTERY AND NEURECTOMY.[1]

By FERDINAND H. GROSS, M.D., Fellow of the Philadelphia Academy of Surgery, Surgeon to the German Hospital, Philadelphia, etc.

IT is not proposed in this paper to treat *in extenso* of the general subject of trigeminal neuralgia. My object is to present a single case of this interesting, but dreadful disease, with a condensed clinical history extending over a period of more than nine years, to give an account of the means employed for its relief, and to offer, as I proceed, some incidental remarks.

John G., 64 years of age, a German, married, and by occupation a piano polisher, applied to me August 29, 1873, suffering from neuralgia of the right side of the lower jaw. This was his first attack of the disease, he being at that time in his 55th year. He had always enjoyed good health. The pain manifested itself in paroxysms, and was limited to the region of the lower jaw. There was no fever, pulse slow and without fulness, tongue coated and bowels constipated. Laxative medicines were given to correct the condition of the bowels and tongue. A third of a grain of morphia administered hypodermically at the seat of pain, gave prompt relief. Two decayed teeth on the affected side of the lower jaw were directed to be removed. The injection of morphia was repeated three times with good effect, relieving completely the recurring paroxysms. In about two weeks the patient was well, and returned to his work.

He remained free from the disease for three years and three months, the second attack not occurring until December, 1876. But then relief was not obtained until after three months. The patient did not at that time apply to me for medical advice, but consulted another physician, and not until June, 1880 (over three years later), when the disease returned a third time, did he again come under my treatment. Of his second attack he gives substantially the following account:—

Having for some days felt shooting pains in his lower jaw, which were increasing in severity and occasionally radiating to the corner of his mouth and lips, he applied first to a neighbouring apothecary, who was said to be also a physician. Morphia in powders and mixtures containing this and other narcotics were freely administered. The affected side of the face was repeatedly blistered; the result not being satisfactory, all his remaining teeth, sound and unsound, were next extracted, save only one lateral incisor in the upper jaw. Why this solitary tooth was spared from the useless ravages of the dental forceps, does not appear. When the patient again came under my care, several years later, this incisor was also removed, as, standing alone, it was worse than useless. The other teeth were not all removed at once; seven was the largest number extracted at any one sitting. No improvement followed this procedure. Indeed, what is asserted by writers on this subject, that true trigeminal neuralgia is aggravated by the extraction of the teeth, was verified in this

[1] Read before the Philadelphia Academy of Surgery, December 4, 1882.

instance. Apothecary and dentist now told the patient that they were unable to cure him, and that he had better apply to the surgical clinic of one of the medical schools of the city, and have the "nerves pulled out." He accordingly, in Feb. 1877, applied to the institution alluded to, when it was proposed to operate upon him at the clinic in the following month, and in the mean time some pills were prescribed. Several of these were taken and produced profound narcosis. Awaking from this condition the paroxysms soon returned and became so intensely severe, that he preferred not to have the operation postponed, and applied at once to another surgeon, who, however, did not advise any immediate operative procedure, but resolved first to try other means, among which was electricity. Very little medicine was given internally, only a small number of pills, the composition of which the patient does not know, were administered.

From the account given me, I judge that both the induced and the constant galvanic currents were made use of, and in the order named. The applications were made daily. At first there was not much change, but gradually there was some improvement, and, after persisting with the remedy for about four weeks, the patient was relieved, and again returned to his usual occupation. To recapitulate briefly: The first attack occurred in Aug. 1873, and lasted two weeks; the second, three years and three months later, and continued fully three months. The third attack did not occur until after another period of immunity of three years and three months, when, on June 9, 1880, the patient again came under my treatment.

When I saw him in his third attack he had already been suffering for a week or so. It might suffice to say, that I had to deal with a typical case of prosopalgia affecting the three divisions of the trigeminal nerve, but will refer in detail to the more important and significant features of the case. Whilst there were vaso-motor disturbances and trophic disorders to be mentioned presently, pain was, as is always the case in this disease, the most important symptom. It manifested itself in paroxysms that varied in duration, frequency, and intensity. The character of the pain was that usually described by authors, viz., piercing, flashing, tingling, burning, etc. In his work on the *Practice of Medicine*, the late Prof. Wood, of this city, remarks: "Language has been ransacked to find terms strong enough, and expressive enough to represent at once the intensity and extreme diversity of the pain." I may add in regard to this symptom, that the characteristic *puncta dolorosa* of Valleix existed in the peripheral districts supplied by the various branches of the fifth nerve. The hyperæsthesia of the right half of the scalp was so exquisite that the patient could not bear to brush or comb his hair. The acts of mastication and deglutition induced such paroxysms of suffering, that he would only at long intervals venture to take a little nourishment in a liquid form. To speak was at times positive torture, and he preferred to sit silently and alone in a darkened room, where he would remain for consecutive days and nights without retiring to bed. When food was presented to him he would often, by violent gestures and muffled groans, drive the person bringing it from his presence.

The *point apophysaire* of Trousseau was never found to exist in this case, although pressure was repeatedly and at different periods of the disease made upon the spinous and lateral processes of the cervical vertebræ, and upon the occiput in search of a tender spot. Disturbances of motility, such as muscular spasms of a tonic or clonic character, in the

domain of the facial nerve, as sometimes accompany this malady, were not noticed. I exclude here such grimacing expressions of a voluntary character as these sufferers sometimes indulge in when in the extremes of torture. Whilst it is scarcely to be assumed that the motor filaments of the third division of the fifth nerve could escape being affected, it nevertheless appears that the manifestations of the disease were mainly, if not altogether, through the sensory branches, and that, at all events, there existed no essential irritation in the facial nerve. The vaso-motor and trophic disturbances to be mentioned, were congestion of the conjunctiva, increased lachrymation, frequent flushing of the right cheek, accompanied with tumefaction and a glossy appearance of the skin; at times the venous turgescence produced a deep unilateral lividity of countenance. At such times the patient could not bear the slightest touch of the finger upon the painful points, nor could he utter a word, yet, when spoken to, he would occasionally place both hands firmly upon his forehead, and, after making several violent strokes downwards over his face, as if instinctively to unload the engorged vessels, he would answer a few words.

Herpetic eruptions upon the lips and cheek were sometimes seen. A yellowish fur upon the tongue was thicker and more tenacious upon the affected side; this one-sided coating of the tongue was frequently noticed. The buccal mucous membrane was swollen, and saliva would flow from his mouth. As regards the more general condition of the patient, it is to be said that he was losing weight rapidly from insufficient alimentation. He is a man of short and broad stature, five feet six inches in height, with a large full chest; his normal weight being about 200 pounds. He had always been temperate in the use of liquors; there was no malarial cachexia or anæmia; he had never been afflicted with rheumatism, gout, or syphilis. With the exception of the two previous attacks of neuralgia, his health had usually been good. Although living in an humble way, he had suffered no kind of privation and sustained no traumatism.

In regard to his family record, searching inquiries were made, but failed to reveal that his ancestors had possessed any peculiar tendencies to neurotic diseases, or that they or his immediate relatives had been or were affected with any dyscrasia. The patient is the father of seven children, five of whom are living and grown up, and the only abnormal circumstance concerning these is, that one of them, a girl 19 years of age, is a born imbecile. I do not pretend to say that there is any such relation as cause and effect between the neurotic affection that developed itself in the later years of the parent, and the congenital defect in the nervous system of the offspring.

When I saw the patient at an early stage of his third attack, the suffering was already severe, and the indications to relieve pain were so imperative, that the first thing to be done was to resort to that in this disease indispensable class of remedies, narcotics. Hypodermic injections of morphia had not been used by those who treated him in his second attack, and only by myself, and with good result about seven years previously. This mode of administering the remedy was again employed, beginning with the third of a grain. Partial relief followed for the greater part of twenty-four hours. The injections were continued once and sometimes twice a day for upward of two weeks, the dose being gradually increased. The condition of the patient was rendered thereby more tolerable, but relief was by no means complete. In the mean time his bowels were regulated by suitable laxatives. Hypodermic injections of atropia were next employed and in-

creased to unusually large doses; he became very tolerant of this powerful agent, but the result was less satisfactory than that obtained from the salt of morphia. These articles were occasionally alternated in their use. I did not believe in a malarial cause in this case, but to test the possibility of such an infection, free use of quinine was made, both in small and large doses, but the effect was negative.

As yet the patient presented no appearances of anæmia, but fearing an impoverished condition of the blood from his inability to take sufficient nourishment, iron was prescribed at different times, in the forms of the saccharated carbonate and tincture of the chloride, but the patient was not benefited by either. On the contrary, he complained of an uncomfortable fulness in his head, and became more flushed in the face. For these disagreeable symptoms there was no compensating effect upon the neuralgia. The use of iron, therefore, often so beneficial in some forms of this affection, was abandoned.

This may serve in a general way as an account of the treatment up to the 17th of July, when, because of a temporary illness, I was compelled to relinquish practice and leave the city for two weeks, placing the patient for the time in the care of a medical friend; who again gave large doses of quinine, and in combination with morphia, but the result was no better than before. Locally he applied the ointment of veratria. On my return I continued the use of this local remedy. It produced the characteristic prickling sensation and a certain degree of benumbing of the skin. Arsenic had its trial in the forms of Fowler's solution and in pills, but the disease would not yield. Iodide of potassium was equally ineffective. Some days the remissions were so illy defined that the suffering was described as continuous, but still marked by waves and darts of exalted pain.

Thus far such therapeutic means had been applied as we are wont to make use of as physicians; but the list of these articles is a long one, and was not yet exhausted. Having failed, however, to give more than temporary and partial relief by the use of internal remedies of acknowledged value, I turned next to surgery. The operation of neurectomy at once suggested itself. But what single operation could be resorted to with any hope of relieving an inveterate neuralgia affecting with apparent equal severity all the divisions of the trigeminus? The anatomical impossibility of such an achievement in the present state of surgical therapeutics is clear. It is true, that in operations upon a single nerve-trunk, authors sometimes speak of a dynamic effect upon other nerves, meaning thereby an alterative influence of the traumatic irritation, through reflex action upon near or distant nerves. But this so-called dynamic force in the therapeutic means of medicine and surgery, is one which we must confess our inability to estimate in advance with any degree of accuracy. We are left at best in these cases to await the result of experience, and may sometimes congratulate ourselves upon achievements we were unable to foretell.

Whilst reflecting as to what might be the best means the art of surgery had to offer for the relief of this sufferer, I found that compression of the

right common carotid artery relieved the pain in less than half a minute in the entire affected districts, save at one spot on the lower jaw, and here too it was rendered less intense. Ligature of the common carotid artery for the relief of prosopalgia was first proposed by Nussbaum, and has been practised by different surgeons with varying degrees of success.

Hueter, in the second volume of his *Grundriss der Chirurgie*, published this year (1882), alludes to the statistics of fifty-four cases, and adds that the figure of mortality of this group is of special interest, in that the operation was performed upon otherwise healthy persons; there were three fatal cases, a mortality of only 5 per cent. But we are reminded, that "aside from a vital prognosis of ligation of the common carotid, a regard is also to be had for a functional prognosis, and especially in respect to the brain functions."

The same author records, that in his first successful case of carotid ligation, the patient lost his memory of names. The disturbance of cerebral nutrition may not only be profound and lasting, but the effect may be progressive; and moreover the manifestations may be so varied and manifold that to consider them in detail would extend this paper greatly beyond its intended limits. In all cases of ligation of one common carotid, brain symptoms appeared, according to G. Fischer, in 32 per cent., and in one-half of these led to fatal terminations. An operation of such gravity is therefore not to be rashly resorted to, and we may well hesitate before undertaking it upon a patient already advanced in years. Nevertheless it is not without promise of good result. The foregoing clinical history has revealed that the case was a desperate one. The patient's life had become a continual torment. He had read in a newspaper of the suicide of a sufferer from this disease and voluntarily admitted that his own mind had begun to dwell upon self-destruction.

Having explained to him and to his wife the nature of the operation, its risks, and what good had sometimes been accomplished by it, admitting at the same time that further observations by the profession were needed to determine with more exactness its real value in this disease, he not only expressed his willingness to submit to the operation, but desired that it should be performed without unnecessary delay, since patient as well as medical attendant had lost hope of finding any means of speedy relief outside of operative surgery.

Accordingly he was admitted to a private room in the German Hospital, and on the 19th of August, 1880, the patient being etherized, I ligated the right common carotid artery with the assistance of several of my colleagues, and in the presence of a number of other members of the profession. The patient's short thick neck required a deep dissection to reach the vessel, which was secured at the point of election just above the omohyoid muscle. A carbolized silk ligature was the material used. It was not cut off short, but allowed to hang from the external wound, and this was closed by three silver sutures. The usual antiseptic precautions were observed, with the exception of the carbolized spray, which was not used. After recovery of consciousness the patient was interrogated as to his

feelings. He pointed to the spot on his lower jaw as being still somewhat painful, but expressed himself as relieved at all others.

Desirous of knowing what might be the influence of the ligation of so large a bloodvessel upon the surface temperature of the two sides of the face, I requested Dr. H. S. Bissey, at that time one of the resident physicians at the German Hospital, to make some comparative observations. The surface temperature was carefully taken, with J. Hicks's English thermometers, over corresponding points upon the two sides of the face; the thermometer being allowed to remain eighteen minutes on each point. On the day before the operation the temperature on the two sides of the nose was found to be the same, viz., 95.3° F., on the cheek of the diseased side 95°, on the sound side 95.2°; on the temple of diseased side 96.1°, on sound side 96.7°; thus showing the greatest difference at the points farthest from the median line. The sublingual temperature was the same on both sides, viz., 98.7°. Thereafter the surface observations were confined to the cheeks.

On the 19th, and just before the ligation of the artery, the temperature on the unsound cheek was 95.1°, and on the sound cheek 95.2°. On the same day after the operation, it was found that the mercury on the affected side had fallen to 93.3°, and risen on the sound side to 96.1°. The surface observations were continued for fourteen days after the operation, and the chart shows an average of 95.3° on the affected side, and 97.5° on the other side, or an average difference of 2.2°, the increase being in favour of the sound side. The lowest point to which the mercury descended on the diseased side was 93.3°, and this was, as has been stated, immediately after the ligation; the highest point on the same side was reached on the sixth day, when it stood at 97.3°. These extremes of the temperature corresponded as to the days on which they occurred, with the extremes noted on the sound side, where they were respectively 96.1° and 98.9°. The thermometer in the axilla indicated its highest point on the fifth and sixth days, when it stood at 100.4°. The pulse at no time exceeded 90 nor fell below 68 beats per minute.

The antiseptic dressings of the wound were not disturbed for two days; afterwards they were, as a rule, renewed twice in twenty-four hours. There was very little swelling, and externally the wound healed by first intention, except about the point where the ligature protruded. The sutures were removed on the eighth day. Occasionally there was some discharge from the track of the ligature. The latter came safely away on the sixteenth day after its application. The patient was allowed a bland liquid diet, but experienced some discomfort in swallowing for four or five days.

Twenty-four hours after the operation he began to complain of headache. It was not confined to one side, but generally diffused over the cranium and assumed a remittent type, but entirely disappeared after the ninth day. On the seventh day he noticed a defect in his vision. On closing his left eye, he found he could not see anything at all with the right. But this amaurotic condition was of short duration. In fifteen or twenty minutes from the time it was discovered, sight gradually returned, and has remained good ever since. This purely functional disturbance was probably due to a temporary anæmia of the retina.

The patient remained in the hospital nineteen days. As to the neuralgia, the immediate effect of the ligation was complete relief in the entire districts supplied by the first and second divisions of the trigemi-

nus, and such a modification in the domain of the third division, that pain was felt only at one spot on the lower jaw. I now have to mention an unfortunate occurrence. When the patient retired on the night before leaving the hospital, the atmosphere was very warm. The window of his room and transom over the door were both left open, but during the night there was a change in the weather, the patient was lightly covered, nurse and he were fast asleep, a cool wind blew through the room, and towards morning the patient awoke with a violent chill. He felt badly that day, but returned to his home where he was at once put to bed. On the evening of the fourth day after leaving the hospital his temperature has risen to 102° F., the pulse is 100, and respiration 36 per minute. There is dyspnœa and pain in the chest, rust-coloured, and occasionally bloody expectoration; a physical exploration of the chest confirms the diagnosis, the patient is down with an acute pneumonia of the right lung, affecting to some extent also the left.

It is not necessary for the purposes of this paper to relate with minuteness the daily condition of the patient during this intercurrent disease, nor to give the details of the treatment. I will therefore content myself with brief references to some of the more critical days.

On the seventh day he is weak and very despondent, refused during the night to take either medicine or nourishment. He will not answer questions unless repeatedly urged; but this unwillingness to speak is not now due to pain in the lower jaw, for he has not felt a single twinge of neuralgia since the onset of the pneumonia. This entire absence of pain in the lower jaw at this time, I believed to be due to the inflammation of the lungs acting as a powerful revulsion, and that when its derivative effect would be over, the pain would return at that point where it had not been relieved by the ligation of the carotid. The patient continued greatly discouraged and wished that death might end all his suffering.

On the ninth day he is in a more hopeful state of mind; the temperature is 99.2°, pulse 80, and respiration 30. On the twelfth, however, his condition is exceedingly critical, but passing to the eighteenth day of the disease we find the temperature normal, pulse 66, and respiration 22. In a few days more, resolution has taken place, and the patient is convalescent. But now the neuralgia in the lower jaw returned, and by the 6th of October is quite severe. He needs building up, and is put upon cod-liver oil and saccharated carbonate of iron.

By the 20th of October the pain is so bad that he cannot utter a word, and all his answers are made in writing, even when they are in monosyllables. But the pain does not extend beyond the lower jaw. Electricity is next brought into use, beginning with the faradic battery. Whilst one pole was being applied alternately to the nape of the neck and to the mastoid fossa with the sponge, and the other pole with the wire brush to the lower jaw and cheek, the patient began to speak, and continued to converse freely. These applications were made daily, until the 1st of November, with sufficient improvement to enable him to converse and take nourishment with more comfort. But the occasional use of narcotics was indispensable. The Brown-Séquard neuralgic pills were given; they are composed of the following eight powerful agents: opium, conium, hyoscyamus, ignatia amara, aconite, canabis Indica, stramonium, and belladonna! Doubtless there is sometimes a special virtue in polypharmacy, and a combination of this kind might be expected to demonstrate it. These pills had a stimulant narcotic effect, and gave the patient some temporary

relief, but not as much as large doses of morphia administered alone hypodermically. After giving them for some days, a good deal of muscular tension was produced, with occasional twitching through the entire body, the patient feeling as though he were being suddenly lifted from his chair. When the pills were discontinued these symptoms subsided.

To give electricity a fair trial, the faradic gave place, on the 1st of November, to the galvanic battery, and daily applications of the constant current were continued for two months, with few omissions, and then persisted in for a month longer every third or fourth day. Meanwhile the patient was taking the thirtieth of a grain of arsenious acid thrice daily, its use being occasionally suspended for a few days.

During this long use of electricity and arsenic, which brought us into February, 1881, there was considerable improvement in several respects, especially in nutrition. His appetite and sleep continued good; he could eat most of the time without pain, which was limited to one small spot. His weight increased to 210 pounds. The use of arsenic is continued during February, and the constant current is still occasionally applied. Gradually there is an unfavourable change. The good effect of electricity seems to have reached its acme; indeed, the patient declares that it now does him harm, although I am using weaker currents. The pain radiates to the corner of his mouth and lower lip, and he refuses the further use of the battery.

In the early part of April his suffering is intense, and I again turn to surgery. He was readmitted to the German Hospital, where, on April 19, 1881, just eight months after the ligation of the common carotid, I performed neurectomy upon the inferior dental nerve, the patient being etherized. A curved incision was made, with its convexity presenting downwards and forwards, including the anterior lower edge of the masseter muscle; the bone was trephined at the junction of the body and ramus; the nerve put upon the stretch in both directions and a portion excised. The accompanying artery was severed at the same time, but the hemorrhage was insignificant On the same evening the patient complained of deafness of the right ear, and pain in the right hip in the region of the great sciatic nerve, but all pain about the jaw was gone. The deafness and a giddy feeling about the head disappeared in a week. The pain in the hip lasted only a day or two. On the tenth day after the operation the wound presented a favourable appearance. The stitches were removed, and the patient directed to take an airing in the sunshine. I am indebted to Dr. Strittmatter, the resident physician, for some notes on the case.

The patient remained free from neuralgia after this for about one year and three months, and I saw him during the following summer and autumn only incidentally. On the 19th of August, 1881, he called at my office to pay his respects, reminding me that it was the anniversary of the carotid ligation. He looked exceedingly well, enjoyed a good appetite and quiet sleep; said, however, that he was growing too stout, and had increased in weight to 221 pounds. The only complaint he had to make was about a shortness of breath, and this prevented him from returning to work, and was, indeed, the first indication of an approaching new trouble of an entirely different nature.

During the winter of 1881 and 1882, his dyspnœa increased, and being besides somewhat lame from an old injury to his ankle sustained in his childhood, he could take no exercise at all, and was confined to his house. Under these bad sanitary conditions he again consulted me. The diffi-

culty of breathing was at times very distressing, and he could scarcely ascend the stairs. His feet and ankles were swollen, and fears were entertained of approaching general dropsy. No disease of the heart or kidneys could be discovered, but there was a slight jaundiced appearance, and the urine was charged with biliary colouring matter. The treatment was therefore directed to the condition of the liver. I could detect no effusion in the pleural cavities, and believed the dyspnœa to be due to an œdematous condition of the lungs. To be brief, such remedies as blue mass, podophyllin, taraxacum, and nitro-muriatic acid, were at different times prescribed, with a free use of diuretics. A nutritious, generous diet was always insisted upon. Under a course like this, briefly stated, his condition gradually improved. The liver resumed its functions, the kidneys were kept active, respiration became easy, and ultimately the swollen condition of the lower extremities disappeared. In the course of the spring and early summer his health was fairly restored.

But in the latter part of August, 1882, his old enemy again attacked him. The neuralgia now recurring, for the first time since the carotid ligation (two years previously), in the upper part of the cheek, the infra-orbital region, and on the ala of the nose, and quickly following this, it returned in the lower jaw. In my absence from the city at the time, he was seen by my friend, Dr. Collins, who endeavoured to relieve him of several paroxysms by hypodermic injections of morphia. On my return, in September, I advised, first, neurectomy of the superior maxillary nerve. The patient pointed significantly to the scar on the lower jaw, and himself suggested that I should make one thing of it and repeat the operation there also. But I did not deem it prudent thus to increase the risk, and decided first to excise the superior maxillary nerve and await the result.

Fig. 1.

At the same hospital on the 14th of September last, the patient being again etherized, I performed the operation after the method of A. Wagner. A curvilinear incision was made along the lower border of the orbicularis palpebrarum muscle, and the tissues so dissected off as to expose the upper portion of the levator labii superioris, which was drawn to the inner side, and by means of a small aneurism needle, a silk ligature was passed under the nerve as it emerges from the infra-orbital foramen, and tightly drawn. The flap was then turned up, and just within and along the orbital margin the periosteum was divided and pried loose from the entire floor of the orbit by means of a small elevator. Next, an instrument, Fig. 1, similar to Wagner's spoon-shaped reflecting elevator

(which I had made for the purpose out of a silver teaspoon) was inserted under the periosteum, and the globe and other structures of the orbit lifted up and drawn a little forward out of the way. The polished convex surface of this elevator serves as a reflector. The course of the nerve was then apparent underneath the thin roof of the infra-orbital canal, and this was laid open with a narrow grooved chisel. The nerve was next lifted out of the bony canal clear back to the spheno-maxillary fissure by means of a small hook running off at a right angle from a slender shaft. The nerve was put upon the stretch and by a little delicate dissection separated from the cellular tissue in the spheno-maxillary fissure.

Fig. 2.

Before severing the nerve, the more modern operation of nerve-stretching may now be easily practised, so as to extend its effect clear back to the Gasserian ganglion within the cranium, and in some cases of intra-cranial causes, might do good. Wagner divides the nerve with a pair of scissors. I used a delicate neurotome, having a sharp blunt-pointed blade, but a fourth of an inch long, going off at an angle slightly obtuse, from a slender shaft, Fig. 2. This little blade was inserted into the spheno-maxillary fossa on the outer side of the nerve (*the handle of the knife brought to the nasal side of the orbit, which prevents it from becoming locked against the bone*), made to rotate on its long axis, when the little blade in its sweep from below upwards divided the nerve. I do not say that this little knife is essential, but when it is intended to divide the nerve at the foramen rotundum and the space narrow, it is a convenient instrument. The floor of the orbit varies very much in different skulls; in some the spheno-maxillary fissure and fossa are very narrow. The accompanying artery was lifted from the canal separately. It was small and white, and was for a moment taken for nerve fibre. I concluded to clear the canal of its entire contents, in order to make sure that no such fibres remained and that it might the better serve as a drainage channel for any pus or fluids that might accumulate under the periorbita after the operation. During the entire process the hemorrhage was slight, but we must remember that the carotid had been previously tied. Otherwise, I should have been careful to avoid dividing the infra-orbital artery. Finally, the nerve was drawn out of the infra-orbital foramen and severed from the peripheral branches. The wound was closed by four sutures.

On the second day after the operation the patient experienced a little pain in the lower jaw. In the district supplied by the superior maxillary nerve the neuralgia was all gone and there was anæsthesia of the cheek and side of the nose. There was very little escape of pus from the wound, and aside from nausea, and a little vomiting, which continued for two or three days, the patient did so well that he was able to return home in one week, with the wound almost healed.

For the next four weeks everything appears satisfactory and the patient is exceedingly happy, but now the pain returns in the region of the lower jaw where neurectomy had been performed eighteen months before. Pressure on the toothless gums brings on a paroxysm. That another

operation upon the inferior dental nerve would be required, was not unexpected, either by the patient or surgeon.

Upon my advice, he promptly returned to the hospital, and on the 11th of November submitted to the fourth operation. He was anæsthetized as before; but the jaw was this time trephined in two places. An incision was first made in the line of the old scar, just above the angle of the jaw, and the trephine so applied as to include a portion of the bone just above where it had been trephined before. A piece of the nerve was found sticking in the cancellous structure of the disk of the removed bone, having been divided in the act of trephining. It was plain, therefore, that the nerve had become regenerated and reunited. Next an incision was made along the edge of the jaw anteriorly and the bone trephined a little to the outer side of the mental foramen. The jaw is edentulous and narrow, but the first application of the small instrument used did not expose the dental canal satisfactorily. It was again applied so as to enlarge the opening in a downward and forward direction. The nerve was then seized with the forceps and after a little resistance easily drawn out its entire length. The wounds were cleansed with a solution of carbolic acid and dressed with carbolized oil. No bad symptoms followed this operation. On the fifth day the patient was allowed to sit up, the pain being entirely relieved. The patient returned to his home in two weeks, with the anterior wound almost healed, while there was still some discharge of laudable pus from the posterior one. I desire to say that after the last two operations the patient was placed under the immediate charge of Dr. J. S. Miller, one of the present residents at the hospital, and to whom I am also indebted for some notes on the progress of the case.

When the question of the pathology or etiology of this case is approached, we find ourselves on difficult and uncertain grounds, but this is frequently so in severe and inveterate cases of prosopalgia. In proof of which we need only cite Rosenthal, who said: "In many cases, the diagnosis" (speaking of the nature and origin of the disease) "is merely possible with a greater or less amount of probability, and we can only arrive at greater certainty after prolonged observation." Neuropathologists are at present, so far as I know, unable to lay down rules which will enable us with sufficient certainty in many cases, to diagnosticate whether the cause of the neuralgia be central, peripheral, or intermediate in the nerve-trunk, or in the bony structure of the canals, through which, in the case of the trigeminus, a number of branches pass. But even when the cause can be confidently asserted to be intra-cranial, it may be impossible to understand its real pathological nature.

In the foregoing pages, such general causes as rheumatism, gout, syphilis, malaria, alcoholism, anæmia, and hereditary predisposition, have been incidentally referred to, but I believe we are justified in excluding all of these as etiological momenta in the present case. It is unnecessary to cite here any of those well-known cases in which irritation or compression of the nerve in its intra-cranial course was found to depend upon caries, exostosis, tumours, or aneurism. Nor need I cite those cases in which neuralgias of long standing have been cured by the removal of foreign

bodies that acted as peripheral irritants. In the case under consideration there is no history of a foreign body or any kind of traumatism. Whilst there were no manifestations of defective general nutrition, it remains a matter of speculation as to how far local mal-nutrition may have acted as a factor in the disease. In some instances inflammatory changes have been found in the neurilemma or in the nerve itself, whilst in others the examinations have revealed no appreciable structural change. If from the severe and chronic character of the disease in this patient, and its refusal to yield to certain remedies, and from the relief afforded in two of the divisions of the nerve by the ligation of the carotid artery, we are inclined to the hypothesis of a central origin, we are met, so to speak, by the absence of such manifestations as "extensive reflex muscular contractions during and after the attacks;" the absence too of vertigo, paralysis, local anæsthesia, and any kind of psychical disturbance, some one of which we might expect to find in a case of central origin of such chronicity. Besides, the presence of sensitive points along the nerve fibres, in the intervals of the paroxysms (as was the case here) is regarded by some authors as sometimes revealing a peripheral affection. I can only add that notwithstanding all we have seen of this case, further observations appear to be necessary to determine its true nature and origin.

Meanwhile the patient is relieved; and from the thorough manner in which the superior maxillary and inferior dental nerves have been excised, and from the continued immunity from pain in the ophthalmic division since the carotid ligation, we may now entertain the hope that the patient will be kept free for the rest of his life from the torments of a disease to which he has so often been a martyr.

Considering the patient's age, being now in his sixty-fifth year, he has stood the operations remarkably well. Anstie says: "Very few patients indeed are ever permanently cured who are first attacked with neuralgia after they have entered upon what may be called the degenerative period of existence;" and even says further on, "that trigeminal neuralgias which now occur for the first time, are utterly incurable," but he immediately adds that these cases correspond with the affection named by Trousseau "*tic epeleptiforme*," a group with which this case is fortunately not to be classed. The disease occurs most frequently after the fortieth year. In the article on "Prosopalgia" in the "*Real-Encyclopædie der Gesammten Heilkunde*," contributed by Seeligmueller, the statistics of Masius are referred to, "who counted in 200 cases, 6 between the ages of 9 and 30, 188 between the ages of 30 and 60, and 6 between the ages of 60 and 80." It appears herefrom that first attacks are comparatively less frequent in advanced age. Females are more prone to the disease than males. To quote Rosenthal on another point, he says: "That he has several times seen old men (60 to 70 years of age) suffering from melancholia, complicated with neuralgia of the dental branches;" these cases he attributes to

"senile changes in the osseous canals and arteries." But this patient has exhibited no psychical disturbances, and when free from the torments of physical suffering, has always shown a good-humoured, pliable disposition, and no abnormal mental irritability.

Before closing this paper, which has already reached a greater length than was intended, I will, at the risk of a little repetition, state concisely the effects of the four operations performed:—

1*st*. The effect of the ligation of the common carotid artery was immediate relief in the domain of the first and second divisions of the trigeminal nerve; the period of immunity from pain in the second division being fully two years, while in the first division the pain has never returned, the relief there being probably permanent, and can only be accredited to the carotid ligation. The effect of this operation upon the third division of the nerve was too transient to count for anything.

It is a great satisfaction to be able to add that no impairment of intellect has followed the ligation. After the lapse of nearly two years and a half no disturbance of brain functions has been noticed either by myself or the patient, or by any of those who are habitually associated with him.

2*d*. The first neurectomy of the inferior dental nerve, eight months later, resulted in a period of relief from the neuralgia of about one year and three months—to remain within safe limits.

3*d*. The last two operations, viz., the neurectomy of the superior maxillary and the repetition of the operation upon the inferior dental nerve, were performed within two months of each other, September 14th and November 11th, respectively, and may be considered together. The result thus far is entirely satisfactory, the patient being now completely relieved of the neuralgia.

I desire to express my acknowledgments for assistance in the several operations to my colleagues Drs. J. Collins, M. Franklin, and J. M. Barton, to Dr. Trau of the medical staff of the hospital, and to the assistant physicians who have been already named.

POSTSCRIPT, February 14.—I examined the patient again to-day, five months after the neurectomy of the superior maxillary nerve, and three months after the last operation upon the inferior dental nerve. There has been no return whatever of the neuralgia.

ARTICLE V.

A CLINICAL STUDY OF SYPHILIS OF THE EYE AND ITS APPENDAGES.

By LEARTUS CONNOR, A.M., M.D., of Detroit, Michigan.

EVERY tissue of the eye and its appendages has been invaded by syphilis. It is difficult to form an accurate estimate of the frequency of the

specific eye complications. DeWecker thinks that the eye is involved in only about fifteen per cent. of all the cases of syphilis.

The frequency with which the several tissues of the eye are affected varies greatly. Some tissues, as the iris, are involved in nearly every case. Others, as the optic nerve, are rarely attacked. In acquired syphilis, the iris is first affected and most frequently. Fifty per cent. of all the cases of iritis are due to syphilis. In hereditary syphilis the cornea is commonly the starting point of the disease. In acquired syphilis the order of attack of the several tissues is iris, choroid, retina, optic nerves, sclerotic, cornea, muscles, lids. In hereditary syphilis the order is usually cornea, iris, choroid, walls of the orbit, and lachrymal sac.

In males the eye is affected twice as often as in females. Thus far no reason has been found for the difference. The syphilitic affections of the eye are most common from the ages of thirty to fifty years. In young subjects the eye complications of syphilis are less likely to be attended by anatomical changes, diagnostic of syphilis. Farther, in the young these complications are less obstinate and less dangerous than in the older subjects.

If it is asked why the eye plays such an important part in the course of syphilis, we are unable to answer with any degree of certainty. Probably it is due to the very abundant supply of capillaries and lymphatics in the eye. The probability is enhanced if we accept the theory advanced by Otis and accepted by Cornil, the latest French syphilographer. This theory locates syphilis in a degraded mass of protoplasm, which is capable of affecting all normal protoplasmic matter with which it comes in contact with its own infecting nature. During the period of development and life of the chancre, this matter is engaged in operating upon the protoplasmic matter immediately surrounding it, entering the circulation by the lymphatics. This infecting matter is gradually scattered through the system by means of the bloodvessels. As the blood current is slowest in the capillaries and the calibre of the vessels smallest, this syphilitic matter has a chance to infect some of the blood and cell walls of the capillaries. From this obstruction of the blood current in the capillaries we have the secondary symptoms, and in the eye the iritis, etc., belonging to this stage of the disease. During all this period and following it, the lymphatic vessels have been carrying the broken-down materials left in the tissues by this obstructed blood current, and the more degraded portions of infected protoplasm. Hence their inner coats and glands are kept in a more or less constant state of irritation. This ultimately results in a swelling of the walls, and consequent diminution of the calibre of the vessels. Hence the origin of gummy tumours, necrosed bones, syphilis of the organs of secretion and excretion.

The morbid anatomy of the syphilitic affections of the eye is identical with that of similar tissues of the body elsewhere affected with the same

disease. Thus we find the conjunctiva and membranes lining the tear passages affected as mucous membranes generally. In like manner, the syphilitic affections of the periosteum of the bones surrounding the eye and the tear passages are identical with the syphilitic diseases of the periosteum of the bones elsewhere. The same is true of eyelids, the cornea, sclerotic, iris, ciliary body, choroid, retina, optic nerve, etc.

One positive advantage of the study of the specific lesions of the eye is that we are better able to see the exact manner of their commencement, progress and termination, and the effects of treatment.

In a general way it may be said that the diagnosis of specific lesions of the eye depends upon the recognition of certain groupings of symptoms rather than any one peculiarity of any lesion or symptom.

If seen early in its course, and in well-nourished subjects, the treatment of syphilis of the eye is attended with the most brilliant results. Seen later and in debilitated subjects, the best executed plans of treatment sometimes fail of success.

Constitutional treatment is as important in specific diseases of the eye as in those of the skin, but frequently the local treatment is of even more importance, as it has reference to the preservation of the special structures and functions unharmed while the morbid elements are being eliminated from the body. Especially important is the local treatment of all forms of iritis alone, or complicated with lesions of other parts of the eye. Generally, to prevent the formation of adhesions of the iris to the lens or to break up the same, is to save the eyesight, while the failure to do this means the loss of the eye in whole or in part.

In all cases there is the greatest urgency to remove the inflammation or deposit before the normal tissue has been destroyed.

In this paper I shall direct attention to some of the characteristic specific diseases of the several ocular tissues. Brief abstracts of cases from my note books and from reported cases of other observers, will serve to illustrate each class of cases. Beginning with the eyelids, we find upon their surface all the specific lesions of the skin, so that it is needless to speak of them in detail. Secondary syphilitic sores and tubercular eruptions may be mistaken for epithelial cancer. Occasionally much damage is done to the eyelid from these lesions when not recognized sufficiently early, or when unwisely treated. A few months since a middle-aged coloured man was sent to me for the treatment of an extensive ulceration of the right upper eyelid. Already at his first visit extensive destruction of the lid had occurred. From a careful examination of the case I concluded that it was due to specific ulceration rather than epithelial cancer. Yet a skilful ophthalmic surgeon had made the reverse diagnosis, and had advised complete extirpation of the entire affected upper lid. This would have rendered it impossible to cover the eye with the lid and to keep it lubricated with tears. Hence the eye must have

been rendered useless or actually destroyed by the exposure. The treatment of the lid on the basis of a specific origin of the sore resulted in the saving of the entire remaining portion, so that he is able to cover the eyeball during the act of winking, and so to retain excellent vision. Of course the lid is deformed by the erosion.

Mr. C. S., a moulder by trade, came to me September 10, 1881, especially for the treatment of a tumour of the right upper eyelid, an ulcer at the edge of the same eyelid, and a deep open ulcer with indurated surroundings on the upper portion of the left upper eyelid. He gave a typical history of malignant, specific poisoning, then lasting nearly two years. The septum nasi, the turbinated bones on the left side of the septum, and the inferior turbinated bone on the right side were all so necrosed as to be readily removed at the first visit. He had large gummy deposits in other portions of the body, both knee and elbow joints were so enlarged and so stiff as to greatly interfere with all movements and to render some impossible. The pain in his head was severe and constant, his memory was greatly impaired, he complained of great distress in the precordial region, the respiration and pulse were quite irregular. Both testicles were swollen hard, and the right one was suppurating through the necrosed scrotum. Many lymphatic glands in different portions of the body were enlarged. To sum up in a word, the man was "rotten with syphilis." The necrosed bones were removed, the ulcerating surfaces thoroughly cleansed with disinfecting sprays, and the man ordered potass. iodid. grains thirty, every two hours. One grain of quinine and ten drops of the syr. ferri iodidi were also given at the same time. He was ordered to take a tablespoonful of cod-liver oil after each meal, and in addition to his regular meals two quarts of milk during the day. In about ten days the graver lesions were so under control that the iodide of potassium was stopped and small doses of the biniodide of mercury substituted. It was combined with small doses of quinine and iron. The cod-liver oil, the milk, and the liberal diet were still continued. To the tumours of the eyelids and the open ulcers, I ordered applied three times a day an ointment of the red oxide of mercury grs. xx. to the ounce occasionally; as the case seemed to be at a stand-still the potash iodide was substituted for the mercury iodide. Within two months the tumours and ulcers of the eyelids disappeared and the case slowly progressed toward a complete recovery.

In my own observation, specific tumours of the eyelids have been rare. They have uniformly occurred in bad cases of syphilis in which the general health was greatly broken. In every case I have been compelled to exert every known expedient to improve the general nutrition. The case reported will serve as a sample.

Syphilis of the conjunctiva may take on either of three forms—the chancre, the secondary lesions, or the gummy infiltrations. The chancre is very rare, and does not differ from the chancre of the penis. The secondary lesions are more common. They are small circumscribed spots, elevated, non-vascular, and of a reddish gray colour. The mucous patches of the conjunctiva often make their appearance suddenly after the patient has been free from all manifestations of the disease for years. The gummy tumour of the conjunctiva is rare, and generally involves other tissues

than the conjunctiva. Never having personally met a case of chancre of the conjunctiva, I quote from the *Brit. Med. Jour.*, Jan. 28, 1882, Mr. Wherry's report of a case :—

The patient was a shepherd, aged 23. On the conjunctiva of the right lower lid, a little to the outer side of the centre was an ulcer with an indurated base. Aside from the extensive chemosis the eye was healthy. The lymphatic glands in the parotid and sub-maxillary regions were large and hard. Nothing could be learned of the mode of infection. About five weeks after the eye affection secondary symptoms appeared.

Mr. Nettleship, in Berkley Hill's treatise, reports a similar case, occurring in a little girl, three years of age. In *Gaillard's Med. Jour.*, July, 1880, Dr. Wm. Mastin reports a similar case, occurring in a man. Many other cases are on record. Probably many are unrecognized.

Paralysis of the ocular muscles may be due to many causes, as cold, rheumatism, traumatism, various injuries to the brain, but it also occurs from syphilis. Von Græfe thought that one-third of the cases of ocular paralysis were due to syphilis. Thus it is wise in every case of doubt to entertain the possibility of syphilis. As illustrative of some of the features of this affection, I give the following :—

R. B., aged forty-five, married, a coachman, was referred to me for the treatment of his eye. A month previously his left eye had begun to turn outward, and the upper lid to droop, and he saw double. The weakness of the internal rectus of the left eye had so increased that at the time of his first visit to me he could scarcely move his eye to the median line, or elevate the upper eyelid above the middle of the pupil. He had discovered that by turning his head to the left and both eyes to the left, he was able to avoid the annoyance of the double images, which otherwise troubled him greatly. It will be observed that this relative position of head and eye made the visual axis parallel. Hence he often worked and walked on the street with his head so turned as to enable him to see single, the visual axis of the eyes and line of walking making with each other an acute angle, instead of being parallel. As to the origin of the trouble, I was unable to convince myself that it was due either to rheumatism, cold, or brain lesion. Suspecting syphilis, on careful inquiry, I found that two years previously he had a chancre followed by well-marked secondary symptoms. He had been treated and supposed himself perfectly cured. At the time of his visit to me there was no other discoverable sign of syphilis than the ocular disorder. Being convinced that the cause of the ocular paralysis was syphilis I placed him upon large doses of potassium iodide, and instructed him how to exercise his weakened ocular muscles. Within a week there was a marked improvement, and he steadily progressed to a complete recovery.

Monocular mydriasis and paralysis of accommodation is quite a rare affection, especially if caused by syphilis. The following abstract of a case exhibits some of its features :—

October 20, 1877, Mr. H., a prominent lawyer in a neighbouring city, was sent to me for the treatment of his eye, which had given him great anxiety. His right eye had been lost in childhood by an accident. A few weeks previous to his visit to me, the pupil of his left eye began to

dilate, and for the first time in his life he experienced difficulty in reading ordinary print. This state of things had continued to slowly increase until his visit to me. On examination, I found vision $\frac{20}{xx}$ for distance, but at reading distance he could not distinguish ordinary print. An appropriate pair of convex glasses enabled him to read with ease. His pupil was widely dilated, and almost immovable on exposure to light. The ophthalmoscope revealed nothing abnormal. The subject was a man of splendid physique, a brilliant lawyer, and very active in all of his habits. Although he had passed through great trials of the strength of his nervous system, there was no evidence of any cerebral lesion. The only clue to the origin of the disorder which I could obtain was an obscure history of specific infection several years previously. Accepting this clue, I inferred that there was along some of the lymph vessels a deposit pressing upon the affected nerves. Hence I gave him ten grains of potassium iodide every two hours. I also kept his pupil moderately contracted with the muriate of pilocarpine. Within a week he began to slowly recover. The doses of the iodide were gradually reduced, and after a month discontinued in favour of one-sixth grain doses of the biniodide of mercury. This was continued in combination with various blood and nerve tonics for some six months. There has been no return of the trouble.

I am well aware that this is an unusual result. The usual one is well given by Alexander, in the *Deutsche Med. Wochenschr.*, 1881. After detailing the statistics of thirty-five cases, twenty-five of which were syphilitic, five doubtful, and five traceable to other causes, he says:—

"No case recovered. Ten of the syphilitic cases had grave mental disturbances, and one died in an insane asylum. Thus it appears that monocular paralysis of the accommodation associated with dilated pupil is generally syphilitic, is one of the latest manifestations of syphilis, is always cerebral, precedes mental disturbances, and is incurable."

Possibly Alexander's cases did not receive so energetic treatment as the case reported. But our experience has convinced us that when the nervous system is attacked by syphilis, as large doses of the potassium iodide should be given, and repeated as frequently, as the patient's general condition will render possible. Of course, doses of ten grains of potassium iodide are not be given every two hours unless the case is carefully watched and the doses stopped on the appearance of untoward symptoms. Then the doses are to be diminished or stopped as soon as the end is accomplished for which they were administered. With these precautions, I have never seen any but the happiest effects from such doses as I have mentioned, in desperate cases of cerebral syphilis.

Syphilitic inflammation of the lachrymal sac is the most frequent form of syphilitic inflammation about the adult's eyes. It usually commences as a periosteal inflammation at the inner corner of the orbit. The sac ulcerates, if the disease be unchecked, and the ulceration extends to the conjunctiva. Stricture of the duct is quite sure to follow. If seen sufficiently early, specific treatment alone often suffices to cure the trouble. Later it must have not only specific treatment, but the local treatment for

stricture of the tear-passages. In view of the frequency of cases of this kind, citation of cases seems needless. The special point to be ever practically borne in mind is that vigorous antispecific treatment is demanded at the very outset.

Interstitial keratitis is one of the characteristic specific affections of the eye. It is almost always due to hereditary syphilis. So well are these points established, that it will almost always be safe to treat the case on the specific basis, without asking any questions or making any other examination, if this form of keratitis be observed in a young child.

Hattie E., aged seven years, was brought to me for relief from blindness. I found her a pale, slim, light-haired girl, having an appearance of very imperfect nutrition. Her mother and her father, who accompanied her, were well-nourished, healthy appearing persons. She was their only child. During her previous life she was said to have been usually well. The eyes began to fail some two months previously; first the left and then the right eye became affected. With the left eye she could simply distinguish light from darkness; with the right eye she could see rather more, but not sufficiently to count fingers at the distance of one foot. A milky opacity, most dense in the left eye, occupied the place of the normal transparent corneal tissue. Around the sclero-corneal junction there was much vascular injection. The only other marked feature of the case was the presence of Hutchinson's teeth. From the father, evidence was obtained proving that he had been infected previous to marriage. With these data there was no difficulty in establishing the diagnosis of specific keratitis. By the use of the usual remedies, local and constitutional, the corneal opacities gradually disappeared, the eyes became perfectly clear, and the girl rendered the picture of perfect health.

In my experience, specific interstitial keratitis has occurred more frequently in girls than in boys. Of greatest value in the treatment of these cases I have found the local application of hot water, in a manner so systematic as to produce a tonic contraction of the bloodvessels of both the superficial and deep structures of the eye. It greatly adds to the rapid action of the mercurials and tonics. With the efficient co-operation of patients and parents, the treatment of these cases is quite satisfactory, although very tedious.

Syphilis may cause either form of iritis—the plastic attended by an effusion of lymph into the stroma of the iris and at the edge of the pupil —the serous attended by a hypersecretion of aqueous humour instead of plastic lymph, and the parenchymatous iritis attended with a swelling of the iris and hypertrophy of its contents or cellular elements.

Syphilitic iritis is only a variety of parenchymatous iritis. It is readily recognized by the fact that the disease is confined to one or two spots while the rest of the iris is of the normal colour, etc. The elevations of iris are called condylomatous nodules or pustules. Virchow calls them gummy tubercles and found them composed of a cellular element of a new formation with a large number of free nuclei surrounded by a mass

of blastema; some spindle-shaped cells were also found and traces of newly-formed vessels. An iris exhibiting this form of nodule certainly indicates syphilitic infection. The presence of the other forms of iritis do not certainly indicate such infection, although it does, as a matter of fact, often exist.

Practically, it is of importance to separate the form of iritis which occurs with early syphilis from that which occurs with tertiary syphilis. The iritis occurring with the secondary symptoms is readily controlled by treatment. The iritis accompanying tertiary syphilis is much more serious, and usually accompanies or precedes lesions of the retina and choroid.

The principal features of plastic iritis are shown by the following case:—

Mr. B., aged twenty-five, a postmaster in a distant town, was sent to me September, 1881, for the relief of a severe pain in his left eye. The trouble had commenced a week previously; he first thought that some dust had entered his eye; with the pain, the profuse lachrymation, circumcorneal injection, there was marked dimness of vision. On examination I found the vision of the affected eye reduced to $\frac{20}{cc}$, the iris glued to the lens by a plastic exudate, the color a dirty brown, the entire conjunctiva highly injected, greatly increased at the sclero-corneal junction, pain much increased on exposure to light, entire immobility of the iris. There was no doubt about the iritis. As to its origin there was nothing characteristic about its appearance. He at first denied an exposure to specific infection, but finally, by cross-examination, and especially by the remnants of a secondary eruption, I was able to satisfy myself that the iritis was due to early syphilis. Hot water, atropine, oleate of mercury and iodide of potassium energetically pushed, soon succeeded in breaking up the adhesions, and otherwise subduing all the disagreeable symptoms. After five visits he was referred back to his family physician for continued specific treatment.

Most of the characteristic features of specific serous iritis occurring late in the disease are exhibited by the following:—

Mr. R., aged sixty-one, was referred to me by his family physician, for the investigation and treatment of a very painful acute affection of the right eye. A week previous to my first visit he had been taken with what seemed to be a malarial fever. After a couple of days the fever ceased, but his right eye began to trouble him. There was a feeling as if a piece of dirt was in the eye, followed by acute and severe pain, overflow of tears, loss of sight to a great degree, headache, circumcorneal injection. Gradually the pain increased, and the loss of sight and the vascular injection became greater. I found the iris darker in colour than the left iris, of a dull cast, capable of some motion as stimulated by light, slightly adherent to the lens. The anterior chamber was much deeper than it should be. The tension of the eyeball was increased, and lower fourth of cornea punctated. Briefly, we had a case of serous iritis.

In searching for the cause of this outbreak I was at a loss, till one day I chanced to look at the palms of my patient's hands, and saw a scaly eruption. From this, suspecting specific infection, I made careful inquiry, and found that forty years perviously he had a chancre, followed by falling out of the hair, a general eruption and a sore throat, etc. etc. Follow-

ing this as a guide, I had the satisfaction of seeing his entire recovery with a perfect eye. Very often equally slight manifestations of the disease have been the means of unravelling the causation of an obscure case of iritis.

The only form of iritis which can be recognized as characteristic of syphilis is gummy tumour of the iris. If, in any given person, we find complaint of pain in the eye, and on examination, find a redness of a small portion of the sclero-corneal junction, we may look for one of three conditions: (1) A foreign body in the cornea near the reddened part. This is readily detected and removed. (2) A little ulcer as a phlyctenular. This is also readily detected. (3) Syphilitic iritis. In this case we will further find near the margin of the pupil a small elevation in the iris. Having made this observation, we have no need to ask any question farther than is needful to place the patient under vigorous anti-specific treatment.

Illustrating this form of iritis is the following abstract from my note book:—

Mr. T. was referred to me by his physician for the treatment of an acute affection of his left eye. He was a sporting man aged forty, of nervous temperament. His right eye was perfectly normal. The vision of the left eye was reduced to $\frac{20}{cc}$. There was a considerable redness of the conjunctiva, most dense at the lower and outer margin of the cornea. The pupil was much contracted, and at its inner border opposite the spot of greatest conjunctival irritation was a slight elevation of the iris. The iris was also adherent to the lens. The colour of the iris was muddy over and about the swelling in it. There was a very considerable amount of pain in the eye. The diagnosis of specific iritis was at once made from these observations. An inquiry into his history showed that he had been infected a year previously. Hot water, atropia, and oleate of mercury and potassium iodide were systematically employed until the adhesions were broken up and the nodule absorbed.

Speaking in a general manner, the method I follow in using these agents is briefly as follows:—

If a few instillations of a four-grain solution of sulphate of atropine fails to loosen any of the attachments of the iris, I give the patient a prescription for a solution of atropia of the same strength as I have employed, one for some oleate of mercury 6 to 20 per cent. I then direct as follows: On reaching home get a basin of water as hot as the hand can bear. Comfortably seated in front of said basin the patient with his right hand keeps the affected eye bathed in the hot water for five minutes. After the eye has been dried, two minims of the atropia solution are dropped into the eye, care being taken to close the canaliculi by the tip of the forefinger. In fifteen minutes the same process is repeated, and so on for an hour. In two hours the hot water and drops are again used in the same manner for an hour, and so on during the entire day. At each time the oleate of mercury is rubbed into the temple. If the person is of a full habit, a saline purgative is ordered at the very beginning of the treatment. At

the patient's next visit to me, if the progress of the case has not been satisfactory, I instil an eight-grain solution of atropine, or even stronger, if called for, repeating it as frequently as the needs of the case demand. If there be considerable deposit which threatens the eye or the life of the patient, I resort to large doses of the iodide of potassium, twenty or thirty grains every two or three hours, until the danger is past. In the case last reported, twenty grains of potassium iodide were given every three hours for two days. In a short time the nodule was absorbed, and the eye left in a perfect state.

When these infiltrations invade the ciliary body as well as the iris, the result is often less satisfactory.

Mrs. R. was referred to me for the treatment of a trouble with her eyes, which followed an attack of diphtheria. I found a very pale anæmic woman, aged about sixty-five. Both pupils were contracted and bound to the lenses with adhesions. The overflow of tears, the circumcorneal injection, the muddy tint of the iris of either eye made it at once apparent that she was suffering from double iritis. But in the right eye there was also at the lower and outer and lower side of the sclero-corneal junction a swelling. The iris adjacent was involved, and the sclerotic. The pain was excruciatingly severe. Of course the lens had lost its transparency. The tension of the eye was not increased. Recognizing the case as specific, both from the physical appearances and the general history, I at once put into operation every known means for the absorption of this swelling, as well as the breaking up of the iritic adhesions. The latter was done with facility, but in spite of everything that could be done the tumour continued to develop, and with it the pain became intolerable. Finally, the right eye had to be enucleated. The left recovered unharmed. On examining the right eye after removal, it was found that the infiltration had not only destroyed the structures which could be seen in front of the eye, but also a considerable of the lens, ciliary body, and vitreous. The rest of the ciliary body was covered with plastic lymph. The inflammatory process had involved the retina, choroid, and even the optic nerve. It is quite probable that the extensive ravages of this growth were due: (1) to the considerable start that the disease had gained ere treatment of a specific nature was begun; (2) to the depraved general condition incident to her advanced age, general frail constitution, and previous illness. Possibly the eye might have been saved, had the treatment commenced with the first symptoms.

Syphilitic retinitis is a very rare disease. Cohn, the ophthalmic statistician of Germany, states that, in 20,000 cases of eye-diseases, there was not a typical case of syphilitic retinitis. Yet a few undoubted cases are upon record. From these we learn that it occurs with or shortly after the appearance of the secondary symptoms. Statistics far larger than Cohn's show that it occurs in the proportion of three or four cases in a thousand. Its course lasts weeks or months. The sight fails rapidly. The inflammatory changes consist chiefly in a serous infiltration of the retina and sclerosis of the connective-tissue elements. The prognosis is good if the patient be seen early in the attack, as the inflammatory changes do not, as

a rule, affect the nervous elements. The treatment is to bring the patient quickly under the influence of mercury and keep him there. The eyes should be protected from light, and the ciliary muscle kept paralyzed with atropia. But one typical case has occurred under my personal observation. This recovered after about ten months, with perfect vision.

Syphilitic irido-neuro-retinitis is a more common affection, and like it rescued by the ophthalmoscope from the shadowy region of amaurosis. From the following case its salient features may be gathered:—

Mr. M., a medical student, applied to me for relief from his failing vision. On examination, I found that his vision in the right eye had been reduced to $\frac{20}{cc}$, and to $\frac{10}{cc}$ in his left eye. The iris was attached at many points in either eye. The vitreous of each eye was filled with floating black specks; the optic disks were almost entirely obliterated by the swelling of their structures. The retinal veins were greatly engorged, and the arteries reduced to a small thread. The tension of each eye was much more than normal. The field of vision was reduced to objects immediately in front of the eye. The pain in the head and eyes, the flashes of light, he described as dreadful. He gave a distinct history of specific infection, but at the time of his visit to me it was apparent only in his eyes. To reduce the ocular tension, I at once extracted from each temple six ounces of blood; after this the tension was not above the normal. Hot water and atropia and the oleate of mercury were used energetically until they had dilated the pupil fully. After a purge of calomel, potassium iodide was given in ten-grain doses every two hours. The eyes were protected completely from the light, but the patient was not confined to a dark room. By the second day the iris was relieved from its attachments. In a couple of weeks the vitreous began to clear up, and the swelling of the optic nerve papillæ to decidedly decrease. Vision now began to improve gradually. The eye tension returned twice, and was relieved as at first by the local abstraction of blood from the temple. The recovery was slow, but finally complete vision was restored.

Many of these cases are not seen till irretrievable damage is done. When too late for relief, such often frequent the office of the ophthalmologist. As the special features of this affection are identical with the same affection produced by other causes, its differential diagnosis cannot be made out from the eye symptoms alone.

Affections of the optic nerve from syphilis are confined mostly to the tertiary stage. This is worthy of note, because, if recognized sufficiently early, they may be hopefully treated. Their relative frequency may perhaps be gathered from Galezowski's statistics of 166 cases. Of these 50 per cent. were due to diseases of the brain and spinal cord. The origin of these diseases of the nerve-centres is not stated, but it is quite probable that some of them were due to syphilis. Thirteen per cent. were due to traumatism, 9 per cent. were due to alcoholism, 8 per cent. were due to syphilis, and the remaining cases to a great variety of causes.

If recognized early, there is good reason to hope that syphilitic affections of the optic nerve may be so treated as to save good vision. But

how may it be thus recognized? Is there any outward symptom by which an observer may recognize it? None whatever; as experience has shown that grave lesion of the optic nerves may long continue before the patient complains of loss of sight or any other unpleasant symptom. Such being the case, it is clear that the only method by which we may hope to recognize the beginnings of syphilis of the optic nerve is by the routine use of the ophthalmoscope in every syphilitic case, from its commencement to its termination. This may readily be done with less trouble than is required for the examination of a heart. In this manner it has occurred to me to prevent the ravages of extensive specific disease of the optic nerve in several cases.

Further, in all cases of cerebral irritation, the eyes should be examined even if there be no eye symptoms.

During an extensive study of the effects of syphilis upon the brain meninges, Lang has had Schnabel examine his cases with an ophthalmoscope. His published results show that these ophthalmoscopic examinations may greatly aid diagnosis when otherwise meningeal irritation could only be surmised. Thus, Schnabel found in many cases that the ophthalmoscope revealed the presence of inflammation of the retina, or choroid, or both, although the patients had not complained of any trouble with their eyes. In all cases of syphilis attended with persistent pain in the head, with dizziness, nausea, loss of spirits, etc., other signs of cerebral disturbance, the practitioner should not neglect to make a careful examination of the eyes with the ophthalmoscope.

From this brief review of some of the syphilitic affections of the eye, we think the following points are made evident:—

(1) The study of specific ocular diseases is helpful in the diagnosis of certain obscure cases otherwise difficult to make out satisfactorily. Thus, a specific iritis will at once set at rest all doubts as to the origin of a series of indefinite general symptoms which have annoyed the patient and puzzled the doctor.

(2) The careful attention to these cases is the only method by which, in many cases, the eyes can be saved intact during the course of the disease. Surely, when such attention can save eyesight in some cases, it is criminal not to give it to every case.

(3) The study of these lesions calls for the most searching examination of the entire organism. Especially is this true of such affections as cannot be distinguished from like diseases of the eye due to far different causes. Thus, if the early treatment of a dacrocystitis be simply local, it is sure to fail if it be of specific origin. Hence, the only chance to avoid failure lies in such an examination as will reveal its specific nature. The same remark applies with even greater force to many other specific diseases of the eye, as will be gathered from our brief review. From this it follows

that, in every eye case, the only safe practice is to constantly entertain the possibility of specific infection.

(4) The treatment of every specific case calls for constant watchfulness of the eyes with the ophthalmoscope, otherwise lesions impossible to repair may be established before the practitioner is aware of their existence or of any danger. Perhaps in no class of troubles is it more apparent that the general and special knowledge of morbid phenomena need to be constantly combined in one person. The special practitioner needs to be a general one, and the general practitioner a special one.

103 CASS ST., S. W. COR. LAFAYETTE AVE.

ARTICLE VI.

THE CLINICAL HISTORY AND EXACT LOCALIZATION OF PERINEPHRIC ABSCESSES. By JOHN B. ROBERTS, M.D., of Philadelphia.[1]

PURULENT collections in the cellular and adipose tissue surrounding the kidney are very properly termed perinephric, or circumrenal, abscesses. It has recently become somewhat customary to speak of them as perinephritic abscesses. I believe that perinephric is etymologically the more correct adjective. We speak with propriety of hepatic, pneumonic, and prostatic abscesses, instead of hepatitic, pneumonitic, and prostatitic abscesses. Hence perinephric, perimetric, and perityphlic are preferable to the longer forms, which, moreover, in most instances are evidently derived from the corresponding term designating inflammation, while general analogy requires the nomenclature to have an anatomical rather than an etiological derivation.

Perinephric abscess is more common than is usually supposed, and its presumed rarity causes its existence to be often unsuspected.

Causes.—Inflammation and suppuration may occur in the tissue surrounding the kidney from contusions and other wounds, strains from muscular activity, exposure to cold, and various depressing blood conditions, such as septicæmia and typhoid fever. Again, perinephritis and perinephric abscess may arise secondarily from disease of the kidney. Inflammation of the renal pelvis, of the kidney structure, or of both, especially when suppurative or when due to calculi, cystic disease, or cancer, can easily induce inflammation of the surrounding cellular tissue. Abscess will almost certainly occur, if urine, pus, a fragment of calculus, or parasites escape from the kidney or its appendages into the meshes of its fatty envelope. In a similar way secondary perinephric inflammation

[1] Read before the Philada. Academy of Surgery, March 5, 1883.

may be caused by perforation of the colon, by typhlitis, perityphlitis, hepatic abscess, rupture of the gall-bladder, perforation of the diaphragm in cases of empyema or pulmonic abscess, by spinal caries, psoas abscess, peritonitis, pleuritis, and indeed by inflammation of any adjacent organ.

Operations upon the testis and cord and pelvic viscera, such as castration, excision of the rectum, and lithotomy, and puerperal inflammations may induce perinephric abscess on account of the continuity of the cellular tissue in the pelvis with that in the kidney region. Inflammatory affections of the genito-urinary organs are factors in the production of perinephric abscess of primary importance. These organs are embryologically and anatomically connected with the kidney through the bladder and ureter; hence the extension of the inflammation to the kidney and thence to the perinephric tissue is easily understood. Cases are even recorded as due to permanent catheters.[1] Another mode of transference is by the continuity of the retroperitoneal connective tissue. This may allow the morbid process to extend by continuity of structure from the membranous urethra, prostate gland, bladder, and seminal vesicles to the tissue around the kidney without involving the kidney or other structures to any noticeable extent.

The agency of the veins and nerves in establishing a pathological union between the pelvic organs and the renal region is doubtless very effective. Embolic and septic processes and neuropathic influences become very possible and intelligible when we think of the direct blood and nerve routes between the pelvic and lumbar regions. For example, what could be more direct than the connection of the testes and scrotum with the renal region by means of the spermatic vein and ilio-inguinal nerve. Many similar though less obvious anatomical bonds can be comprehended.

Symptoms.—The constitutional symptoms of pus in the perinephric tissue are liable to the variations seen in other suppurative inflammations. Rigors, febrile movement, sweating, anorexia, vomiting, constipation, and perhaps delirium are marked in acute cases, while in chronic cases there may be so few constitutional symptoms that the existence of internal suppuration is overlooked. Constipation is sometimes very obstinate and apparently due to pressure on the colon. On the left side especially the colon can readily be compressed by swelling of the tissues in front of the kidney. When perinephric abscess follows puerperal perimetritis and similar conditions, the violence of the symptoms and a rapid death may interfere with recognition of the secondary trouble near the kidney.

The fever is sometimes continuous, and resembles typhoid fever; at other times its intermittent character suggests malarial influences. In perinephric abscess which has been allowed to burrow, septicæmic symptoms become prominent.

[1] Nieden, Deutsches Archiv für klinische Medicine, 1878. Bd. xxii. Fälle 92 and 93.

The pain in its onset is often sudden. It is usually referred to the loin and side, is increased by pressure, and may shoot down the thigh, or into the genital region. Pain in the scrotum and penis at times occurs as a quite prominent symptom. Retraction of the testicle towards the inguinal canal may take place. It is stated that this does not occur, even when pain is experienced in the organ, unless there is, in addition to the perinephritis,[1] disease of the kidney, such as calculous nephritis. If this is true, it is a valuable diagnostic point in the differentiation of secondary from primitive perinephric abscesses. I doubt the accuracy of the statement. Nieden in his table records only sixteen cases in which pain was noted in the abdomen, groin, thigh, and genitals. Gibney has seen cases in which pain was felt in the knee as in coxalgia.[2] The lumbar and other pains may remit, disappear entirely for several days, or be altogether absent. The pain of perinephritis causes the patient to immobilize the spine, and assume, according to Gibney,[3] a stooping posture with the shoulders elevated.

Spasmodic action of the psoas muscle often induces, in the course of a week or ten days, flexion of the thigh upon the pelvis. The pain may be relieved by this posture. It is not uncommon in subacute cases for the patient, in order to relax the psoas, to walk with the body bent forward, and with the hand of the affected side resting upon the middle of the thigh. To relax the parts, the trunk is sometimes bent laterally, so that the ribs approach the iliac crest.

The position of the thigh is a symptom of great value, and may be attributed to coxalgia or rheumatism instead of to perinephritis. I believe flexion of the thigh to be an accompaniment especially of perinephric abscesses at the lower third of the kidney. It is recorded as observed in 27 out of 166 cases tabulated by Nieden. The flexion may be merely sufficient to prevent extreme passive extension of the hip, or so great as to draw the thigh firmly up against the abdomen. When thus bent, pain may be absent, but the slightest attempt at extension causes complaint. The hip may therefore be continuously flexed. Hence the patient may scarcely be able to turn over in bed to allow examination of the loin. All motions of the hip except extension may be perfect and painless. Difficulty in voluntary adduction of thigh has been mentioned by Gibney[4] in a case in which the thigh was semiflexed, and rotated outward. In another case he found towards the end of the affection slight resistance to complete passive flexion of the thigh on the abdomen. These symptoms pointed strongly to possible coxitis; but the subsequent history did not cause Dr.

[1] Nieden, Deutsches Archiv für klinische Medicine, 1878. Bd. xxii. S. 498.

[2] Amer. Journ. Medical Sciences, 1877, vol. i. p. 399; Id., 1878, vol. ii. p. 403; and elsewhere.

[3] Chicago Medical Journal and Examiner, June, 1880.

[4] Amer. Journ. Med. Sciences, 1877, vol. i. p. 395 and p. 401.

Gibney to change his diagnosis of perinephritis cured by resolution. The same author has described[1] a case where adduction in addition to flexion existed. Cure followed incision giving escape to about a pint of pus.

These abnormal positions and interferences with function of the thigh lead in subacute cases to a gait that is remarkably suggestive of the second stage of coxalgia. When pain in the knee coexists, the acutest observer must be guarded in diagnosis and prognosis. I have found one case reported[2] in which convulsive movements of the leg occurred as a symptom of perinephric abscess consecutive to cancer of the kidney; and another[3] in which the large tumour caused œdema of the lower extremity.

Involvement of the lumbar plexus by pressure of the inflammatory products may give rise to general or localized anæsthesia, or temporary motor paralysis of the thigh. These symptoms occurred in eight of the cases contained in Nieden's table. The same writer records a case[4] in which there was paresis of both legs; and another[5] in which a left side abscess was accompanied by left pleuritis and paresis of both legs and the right arm. The latter case went on to suppuration; in the former resolution occurred. Neuralgic troubles may be induced by similar pressure and interference with the nerve branches.

It is generally said that the urine presents only those changes incidental to the febrile condition, unless the perinephritis be secondary to calculous nephritis, vesical inflammation, or similar causes. Then it may contain blood, pus, albumen, and tube-casts. My experience shows that a large amount of albumen may be present, probably from venous obstruction, when no kidney lesion of moment exists. It is remarkable that in Nieden's table there is not a single case mentioned in which albuminuria without purulent urine was noted. This may be owing to careless observation by the original reporters. Hæmaturia is not very unusual at the beginning of traumatic perinephritis.

Incontinence of urine and frequent or painful micturition have been observed. These symptoms are probably due to the abundant urates or to other chemical changes in the urine occurring with the febrile condition, or to the disturbance of the innervation of the pelvic organs.

Distressing flatulency and irregular constipation have been noticed by Moxon,[6] who ascribes these symptoms to inflammatory thickening involving the nervous structures around the vena cava and aorta, and thus causing paralysis of the abdominal sympathetic. This is, he thinks, more likely to occur in left-side perinephritis, than in cases of disease on the right side, such as he describes in his remarks.

Dulness on percussion of the space between the ribs and the crest of the

[1] Chicago Med. Journ. and Examiner, June, 1880, Case XXVI.
[2] Nieden, Case 105.
[3] Nieden, Case 149.
[4] No. 151.
[5] No. 150.
[6] Lancet, May 1, 1875, p. 603.

ilium is usually found; and pressure made by the hands, placed one in front and one behind, will sometimes discover a tumour, or elicit a feeling of elastic resistance or indistinct fluctuation. The tumour thus perceptible is rounded, with smooth edges, and moves little, if at all, with the respiratory act. The girth of the lumbar region becomes from swelling unsymmetrical, and the affected side measures one to two inches more than the opposite region. This is best appreciated by measurement with the tape, for the swelling may be general and not localized. There may also be broadening of the buttock, effacement of the normal hollow in the loin, increased girth of the upper portion of the thigh, effacement of the dimple over the trochanter, and spinal deviation towards the diseased side. The tumour discovered by palpation must be distinguished on the left side from feces in the descending and sigmoid portions of the colon; and on the right from liver tumour. Evacuation of the contents of the great intestine by laxatives and enemas, and the normal situation of the colon percussion-tympany, will remove one source of doubt; and the motion of the liver during respiratory acts will get rid of the other.

The tumefaction is accompanied by a subjective tenderness and sense of tension, which will probably be increased as suppuration occurs in the inflamed tissue. It may also cause dyspnœa from pressure upwards against the diaphragm.

Finally, in those cases of perinephritis which do not result in resolution, fluctuation becomes evident. This is preceded, perhaps, by rigors, local œdema, redness, and exquisite pain on pressure over the advancing pus. When the abscess is opened, either spontaneously or by operation, the febrile temperature falls, the digestive organs perform their functions properly, and the patient is relieved of pain. Cure soon follows, unless complications or extensive burrowing of pus have occurred. In chronic perinephric abscess the symptoms may be very obscure.

The clinical characteristics of perinephric abscess and its proper treatment will be illustrated by the following history:—

CASE I. *Perinephric Abscess, subsequent to Internal Urethrotomy, treated by Incision; Rapid Recovery.*—A gentleman who had suffered during a number of years with an irritable stricture of large calibre, was subjected, in February, 1882, to internal urethrotomy. After the operation, which was done by a distinguished professor of surgery, a large bougie was passed (36 French). Subsequently he had in the course of a few days three chills; but was soon able, though weak, to go out of the house. The urethra was systematically dilated with large instruments during this period. Two or three weeks after the division of the stricture he consulted me, because of intense pain in the right lumbar region and right testicle, for which he had kept his bed during several days. There was great pain on motion, which sometimes persisted even when the man kept still; but nothing abnormal, except tenderness on pressure, could be detected in the loin. I looked upon the case as one of myalgia, or of

nephralgia; and prescribed quinia, morphia, and belladonna, and applied a blister over the painful area.

Considerable amelioration of pain occurred in a few days, and I thought he was getting well; but this was a very temporary improvement. I then examined the urine, which contained no pus, by the liquor potassæ test, and showed no bloody discoloration. It contained, however, a large amount of albumen. The pain continued in varying intensity, and was accompanied with great tenderness on both sides of the spine and over the sacrum. He complained of anomalous feelings in the right lower extremity, which was described as being like a "limb asleep" rather than painful. Motion, however, was good, though performed slowly and with care. No heart or lung lesion was discovered by physical exploration. There was no apparent fever, no chills, no special digestive disorder; and the urine was voided freely and in a large stream. No history of gravel having ever been passed could be obtained. A few days later I thought I detected a slight fulness near the lumbar spines, in the region of the kidney, but no fluctuation could be distinctly obtained. At this time the urine showed a slight trace of albumen, had specific gravity of 1012, and contained no sugar. I considered the pain which existed to be occasioned by pressure on the lumbar plexus by some kidney affection, probably due to the chronic stricture. The pain in the scrotum was less than formerly, but the paresis of sensation in the thigh remained.

On March 24th the swelling in the loin was more marked, and the local tenderness great. A large bougie could readily be passed through the urethra. The introduction of a sound failed to discover any calculi or calculous material in the bladder. The morning and evening temperature was reported by the nurse as below 100°; there were no chills, and the pulse was 80 to 90. Dr. John Ashhurst, at my request, saw the patient with me in consultation, and thought there was œdema over the swollen surface. We made the diagnosis of abscess in the cellular tissue around the kidney, which Dr. Ashhurst thought to be still below the muscular masses of the back. Poultices and the application of tincture of iodine were resorted to as the local treatment.

Six days later I thought it would be proper to evacuate the pus, as fluctuation seemed more distinct. At this time the pain had become less severe, and there was no longer any albuminuria. Asking Dr. Ashhurst to see the case a second time, I found that he concurred in the belief that operation was advisable. I accordingly made a vertical incision, one and a quarter inches long, through the skin and lumbar fascia. Introducing my forefinger, I bored down through the softened muscles, between two lumbar transverse processes, until at nearly the full length of my finger I evacuated two or three fluidrachms of pus; a drainage tube was introduced, and the wound poulticed. Carbolized injections through the tube were subsequently used every day.

On the third day after this procedure, a note was made to the effect that there was little or no pain on pressure in the lumbar region, and that the pain and numbness in the right buttock and extremity had disappeared since the operation. The convalescence was rapid and uninterrupted. On the tenth day he was sitting up and walking about his room a little. About this time he began cautiously using a large bougie again. The last note, made about one month later, says he is strong and well, and walks a good deal. He still had a slightly tender spot over the sacrum near the middle line, and the stricture was irritable after smoking.

I have purposely omitted the details of treatment, because they are not important in studying the clinical history. The symptoms are, however, in my opinion, of great interest, because they localize so distinctly the position of the small abscess. The pain felt early in the disease in the scrotum and testicle, and the paresis of sensation, which soon affected the buttock and the front and outside of the thigh, show that the pressure was exerted upon the ilio-hypogastric, ilio-inguinal, genito-crural, and external cutaneous nerves. These nerves are branches of the first and second lumbar nerves, which also supply branches to the back. Hence it is evident that the abscess was situated at the level of the first and second lumbar vertebræ. This inference is rendered more conclusive by the existence of albuminuria, which was due to pressure on the renal vein causing congestion of the kidneys. This vein is known to be situated[1] on a level with the first lumbar vertebral body.

As the abscess approached the surface of the back, pain in the scrotum diminished, and albumen disappeared from the urine, because pressure was decreased. There was no tonic spasm of the psoas, iliacus, or pectineus muscles, causing flexion of the hip, as in the case which I shall presently describe, because the abscess was too high up to press upon the third and fourth lumbar nerves, whose branches supply the muscles mentioned. It is probable that if the incision had not been made, the abscess by burrowing downwards would finally have given rise to flexion of the thigh upon the pelvis. I do not feel sure of this, because the position of the abscess behind the kidney might have led to spontaneous evacuation through the muscles of the back before the quantity of pus had become sufficient to involve the structures opposite and below the inferior end of the kidney.[2]

These points in surgical anatomy I deem important, because I have not seen them mentioned in connection with perinephritis. They will serve as good guides in the determination of the position of the incision, when the surgeon feels called upon to explore a suspected perinephric abscess.

Cases are reported where incision or puncture failed to find pus in instances whose subsequent history confirmed the diagnosis of abscess. A more careful study of symptoms may hereafter enable us to localize the pus more exactly.

Untreated perinephric abscess, if life is prolonged, usually opens in the lumbar region; but the pus may be discharged into the colon, stomach, small intestine, pleural cavity, bronchial tubes, pericardium, or peritoneal

[1] See Braune's Topographical Anatomy, Bellamy's translation, p. 129.

[2] In January and February of this year (1883), after the above paragraphs had been written, this patient was treated by me for a chronic perinephric abscess, situated three or four inches below the cicatrix of the first. There was no albuminuria and no scrotal pain; but flexion of the hip was marked. The abscess was evidently connected with the old seat of disease, for pus was subsequently evacuated also from the vicinity of the first incision.

cavity; or the abscess may open upon the surface in the hypochondrium, below Poupart's ligament, upon the buttock through the sciatic notch, or by perforating the ilium, or discharge into the pelvis of the kidney, the bladder, vagina, or urethra. The pus may find its way into the sub-iliac bursa, and, by the communication that often exists between this sac and the hip-joint, even enter the joint itself. It may burrow into the scrotum. The pus may amount to three or four pints, and may, especially in consecutive abscesses, be thin, ichorous, and mixed with urine. It may be offensive and fecal in odour, even when there is reason to believe that no intestinal fistule communicates with the pus cavity. In primitive perinephric abscess the pus is thick and odourless, and perhaps contains shreds of connective tissue. Trousseau has observed[1] emphysema under the integument of the back from an opening between the gut and the abscess. The large amounts of pus only occur when delay in operating has allowed extensive suppuration. Bowditch[2] believes in the frequent occurrence of thoracic complications from contiguity with perinephric abscesses. He describes two cases, in which he was consulted for lung disease, that were found to be perinephric abscesses opening through the lung.

The following case illustrates the course of the disease when not treated by prompt surgical measures:—

CASE II. *Probable Perinephric Abscess following Gonorrhœa; Condition not suspected; Death with Septicæmic Symptoms.*—This history, which dates back a number of years, is a humiliating one, for, though the patient was seen by myself and several other medical men, the possible existence of perinephric abscess was not suggested until death had occurred. When subsequently thinking over the circumstances, I became convinced that the purulent collection, for which we had searched in vain in the pelvic and anterior abdominal regions, should have been looked for in the lumbar region. Though proof was then unattainable, I believed, and still believe, the posthumous diagnosis probably correct.

The patient, on account of gonorrhœa, had retention of urine, which required catheterization. Subsequently orchitis with scrotal abscess occurred, and about the same time, or perhaps a little previously, a small abscess on the outer aspect of the left thigh appeared. Both these collections of pus were evacuated by incision. During the maturation and cure of these abscesses, the right hip became somewhat flexed. When I saw him after an absence of some weeks, I found the thigh firmly flexed, and the patient weak, nervous, and hysterical, afraid of any examination, and continually desiring morphia or ether. He could not move his thigh because of pain, nor would he allow it to be extended. It was thought probable that the position of the right limb was originally due to the patient having assumed this posture to keep the scrotum and left thigh free from pressure of the bed-clothes, and that the voluntary disuse of the joint during a series of weeks had induced in his irritable and nervous condition a hysterical contraction. Ether was administered, and the hip forcibly

[1] Clinical Medicine.

[2] Medical and Surgical Reports of Boston City Hospital for 1870.

extended with a cracking noise, similar to that heard in breaking up arthritic adhesions.

After regaining consciousness, the man could move the limb to a limited extent without marked pain. Permanent extension was made by attaching a weight to the foot. Five or six days later the weight was removed because of pain. The flexion then recurred. The etherization was done about two months after the time of contracting the original gonorrhœal trouble. Owing to unavoidable circumstances, I only saw the patient occasionally and at long intervals. The daily treatment was carried out by my medical friends, and occasionally either I or another surgeon saw him.

My notes, dated about six weeks after the day of etherization, show that the general condition had steadily become worse, notwithstanding the exhibition of quinia, iron, and milk punch. Hebetude, delirium, dry tongue, chilliness, sweating, emaciation, and great prostration made us believe that septicæmic processes were present. There was no marked pain except on attempting to move the right hip-joint; but some abdominal tenderness apparently existed. The urine was freely passed, no pulmonary change was found on auscultation, and neither palpation of the abdomen nor digital exploration of the rectum revealed the purulent accumulation sought for in the abdomen or pelvis. I have no note or recollection of the patient experiencing pain in the lumbar region; nor of the loin being examined with special reference to the possibility of the abscess being as high as the kidney.

Four months and a few days after contracting gonorrhœa, the patient died. After death, an attendant, in the words of my note book, "found gurgling at upper part of right thigh, as if a decomposing abscess had worked down from within pelvis or abdomen."

I now feel that the flexion of the thigh was probably due from the first to perinephritis, causing little or no lumbar pain, but which finally gave rise to an abscess in the cellular tissue around the kidney. This abscess increased and slowly burrowed behind the peritoneum and along the psoas muscle until it reached the groin. Here it would probably have evacuated itself spontaneously, if life had been prolonged. It is impossible now to determine whether examination of the loin would have led to its discovery, or operative treatment have been followed by convalescence.

Complications.—Numerous complications may arise if perinephric abscesses are allowed to increase indefinitely until spontaneous evacuation occurs. I have already spoken of the directions in which this may take place. The complications, such as peritonitis, which may accompany such events, need not be discussed. The kidney, according to Ebstein,[1] becomes involved secondarily from disturbance of its nutrition produced by the inflammation located in the perinephric structures. Cloudy swelling of the epithelial cells, necrosis or abscess of the kidney structures, and dimunition and induration from pressure are mentioned by him. These effects can easily be understood on considering the clinical history of the case first reported, where there was abundant albumen in the urine due undoubtedly to pressure upon the renal vein.

[1] Ziemssen's Cyclopædia of Medicine, vol. xv. p. 593. New York, 1877.

The danger of thoracic involvement is insisted upon by Bowditch. In nine cases of perinephric abscess, auscultatory signs of pulmonary implication were discovered by him in seven. Although some of these presented no marked chest symptoms, he regarded these physical signs an important argument for operation in the loin, because they showed that the inflammation was travelling upward and beyond the original site.

Diagnosis.—In the very early stages of perinephric abscess the diagnosis is often impracticable. Especially is this so when the symptoms are not very pronounced, and when there have been no previous renal symptoms to direct attention to the vicinity of the kidney. The symptoms already described make the diagnosis easy, as a rule, when the inflammatory process has advanced beyond the initial stage. Lumbago simulates the pain of perinephric abscess, but it is unaccompanied by fever, and causes the patient to walk with a rigidity of spine that is different from the lameness due to the partially flexed hip of perinephritis. I must admit, however, that there may be little or no fever in the latter disease, and that the pain may cause a mere stiffness of the spine without any spasm of the psoas being present. Moreover, the impairment of the hip motions may in some cases of perinephritis occur late, or may, indeed, be altogether absent.

Aching kidney[1] and nephralgia, or neuralgia of the kidney, are terms indefinitely descriptive of pain in the renal region from unknown pathological causes. Aching kidney gives, according to Duncan, a heavy wearing pain, felt especially in the hypochondrium and frequently associated with pain down the limb and with irritability of the bladder. He believes that there exists swelling of the kidney or perinephric tissue, or both, which can be felt by palpation. The location of the pain in the anterior region, the fact, at least in women, that it is increased during menstruation, and the non-sequence of more pronounced symptoms are *supposed* to distinguish this condition from true perinephritis. Nephralgia may be recognized by the paroxysmal character of the pain and the known neuralgic diathesis of the individual, especially if the absence of injury or of genito-urinary irritation is conspicuous.

Organic affections of the kidney may of course be the cause of perinephric abscess by secondary involvement of the cellular tissue around the organ. The diagnosis of renal lesions, without perinephric abscess, is made by the symptoms peculiar to each. Cancer of the kidney is usually accompanied by hematuria, rapid decline in health, and perhaps later by the physical signs of a distinct growth and the involvement of surrounding viscera. The tumour may be nodular.

Renal cysts are not accompanied by local increase of surface temperature, nor by œdema in the lumbar region. These symptoms are distinc-

[1] J. Mathews Duncan, Medical Times and Gazette, Nov. 16, 1878, p. 563.

tive of perinephric abscess. Calculous nephritis is usually preceded, or accompanied, by attacks of intense pain and perhaps vomiting due to small calculi passing down the ureter. The sudden relief of pain when the stone enters the bladder is almost pathognomonic. The existence of pus, blood, and gravel in the urine, when not traceable to bladder disease, always points to lesions of the kidney itself. Such occurrences are not part of the clinical history of perinephric abscess, unless it is secondary to inflammation of the renal pelvis (pyelitis), or to pylo-nephritis.

When percussion or pressure over one of the spinous processes of the vertebral column gives rise to pain, when there seems to be slight angular projection backwards, when straightening or extending the spine by suspending the patient from the armpits relieves pain, and when there is bilateral interference with the innervation of the legs, it is probable that vertebral caries exists. The similarity of some cases of perinephritis to this condition will be evident when I say that the spinal brace has been ordered[1] for a patient suffering with a perinephritis which finally required incision to evacuate pus.

Perityphlic abscess is not likely to be confounded with perinephric abscess, for the tumour-like mass of indurated cellular tissue in the latter case is higher and not so easily felt by palpation of the front of the abdomen, and there is a more marked tendency for flexion of the hip to occur. Perityphlic abscess, on the other hand, is more likely to present forwards, to cause œdema of the corresponding limb from pressure on the iliac vein, and when opened to furnish fetid or stercoraceous pus and gas. The numbness of the thigh and the hip-flexion found at times in perinephric abscesses may also be found in perityphlitis.

Masses of feces, and splenic or hepatic tumours may in rare instances simulate the indurated swelling due to perinephritis. The first can be removed by laxatives; the last two conditions are distinguished from perinephritis by the ease with which they are displaced downwards during inspiration.

Perinephric tumours are retroperitoneal, and therefore on the right side the ascending colon lies to the inner side of such a tumour, while on the left side the descending colon has a position in front of it.[2]

If the abscess around the kidney perforates the diaphragm, and discharges pus into the pleural sac or bronchial tubes, empyema or abscess of the lung may occur. These conditions may be recognized without the existence of perinephric abscess being suspected.[3]

Flexion of the thigh, if present, and the other symptoms of perinephritis, would attract the attention of the careful and intelligent observer,

[1] See Dr. Gibney's paper in Chicago Medical Journal and Examiner, June, 1880.

[2] Nieden in Deutsch. Archiv für klin. Med., Nov. 1878, S. 500, quotes Wells and Simon.

[3] Bowditch, Medical and Surgical Reports of Boston City Hospital, 1870, p. 58.

as they did that of Dr. Bowditch. Cure may occur in such instances after the expectoration of 18 ounces of pus.[1]

Dr. F. Lange has recently reported a case, from Thiersch's clinic in Leipzig, where there existed empyema and a sinus on the front of the thigh, both apparently secondary to a perinephric abscess.[2]

I have purposely postponed the consideration of the differential diagnosis of perinephritis and coxitis, and of perinephritis and inflammation of the psoas muscle until this time, because of the importance and difficulty of the topics.

In perinephritis there is often flexion and painful rigidity of the hip-joint, with perhaps *ad*- or *ab*-duction of the thigh and pain at the knee. These symptoms at once suggest hip-joint disease. Usually in such cases, however, passive flexion of the hip can be made without causing pain, and may even relieve existing pain. Attempted extension of the thigh is, on the contrary, at once painful. This aids in diagnosticating the condition from coxitis, where all motions are apt to be painful. There will probably be found less rigidity of the adductors in perinephritis than in coxitis.

In coxitis there is often fulness and tenderness on pressure over the trochanter or joint, pain on percussion of the femur, and subsequent shortening and atrophy of the thigh. There is, however, no fulness in the lumbar region, which is a frequent feature of perinephric abscess. The semicircumference of the trunk on the affected side will, in the latter disease, often be increased one to one and a quarter inches. Atrophy of the thigh occurs also in perinephritis if the limb is flexed and not used for a long time; hence great caution is at times required to avoid committing an error in diagnosis. Gibney believes that many reported cures of hip disease, with perfect return of function, are, in truth, instances of perinephritis cured by resolution, which have been mistaken for coxitis.

Inflammation of the psoas muscle and psoas abscess present some of the characteristics of perinephric abscess. Usually, however, there are associated with psoas abscess symptoms of caries of the vertebra, such as a painful spinous process, when pressure is made along the spinal column posteriorly. In psoas troubles there is apt to be more tenderness and pain in front than in perinephritis. The impaired motion of the hip-joint and the interference with the innervation of the thigh are similar to what is found in perinephric abscesses involving the psoas muscle secondarily. There is, however, neither pain nor fulness in the loin.

The diagnosis between coxitis or psoitis and perinephritis must in obscure cases rest upon the combination of symptoms and the progress from day to day. A careful study of the section of this article devoted to the symptomatology of perinephritis will render a diagnosis usually practi-

[1] Neiden, Case 98.

[2] New York Med. Journ., January 27, 1883.

cable within a short time. In the early stages an absolute diagnosis may be impossible.

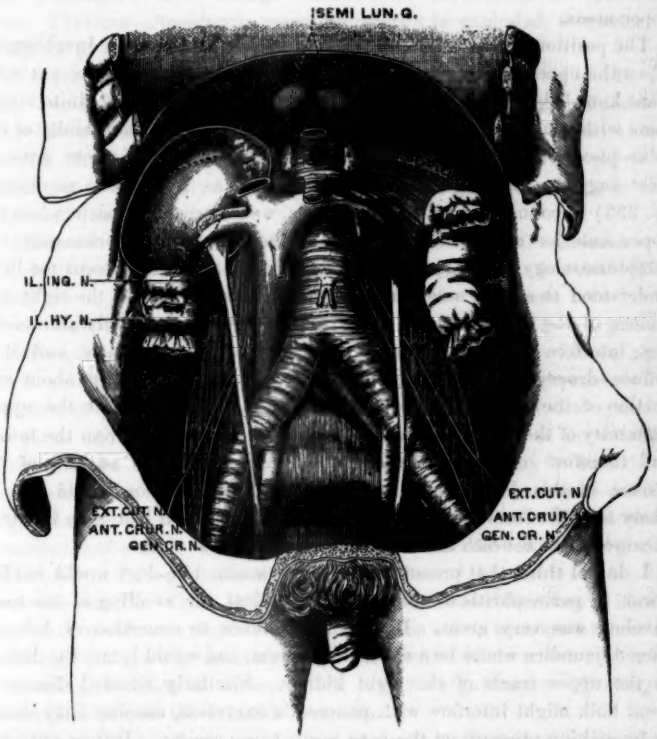
Localization.—The early recognition of the existence of perinephric abscess and the determination of its relative position with regard to the kidney is important. The promptness and efficiency of operative treatment must depend very much upon the early recognition of the exact position of the abscess. Cases have been reported in which incision or puncture failed to reach the suspected abscess-cavity, though the subsequent clinical history proved the correctness of the diagnosis. More exact comprehension of the bearing of locality upon symptoms, might, as is readily seen, have affected the position chosen for operation and thus have given earlier exit to the pus. The symptoms already described will enable the surgeon to make in the majority of cases the diagnosis quite early. I shall now therefore study the symptoms in connection with the surgical anatomy of the region, in the endeavour to bring out points which will make it possible to localize perinephric inflammation and abscess. As far as I know this line of investigation is new. Hence as no foundation for my conclusions has within my knowledge been laid by other writers, and as I have no corroborative evidence except in my own limited experience, the propositions and the deductions resulting from my dissections and studies should be accepted as suggestive and not final.

I arbitrarily divide the perinephric cellulo-fatty tissue into six tracts. The upper, middle, and lower anterior; and the upper, middle, and lower posterior tracts. There is of course no sharp definition between these regions, which are used to conveniently indicate the location of the disease. In discussing the subject I shall speak of inflammation and of abscess interchangeably though the symptoms of pressure are more marked in the latter event.

It may be premised as an axiomatic truth that, although there may be pains radiating in various directions, anterior inflammations will give rise to pain especially in the front or side of the abdomen, posterior lesions to pain in the loin. Tenderness upon pressure, œdema over the abscess and pointing will be similarly exhibited. The swelling, the tumour-like outlines and the feeling of resistance to palpation will naturally be the more evident in anterior lesions because the tissues between the disease and the surface are flaccid. Involvement of the chain of sympathetic ganglia, situated along each side of the spinal column, would occur in posterior lesions only. We, however, are ignorant of what symptoms would result from such inflammatory irritation or pressure.

In the two upper regions perinephric abscess is very liable to give rise to localized pleuritis of the bottom of the pleural sac. This is especially the case when the inflammation exists in the upper part of the *posterior* tract. The superior portion of the kidney lies upon the diaphragm, the lower margin of which crosses the back of the kidney in a direction obliquely

downwards and outwards. This is indicated in the wood-cut drawn from one of my dissections. This relation of the diaphragm is also shown by the depression of the kidney which occurs on deep inspiration. Holden says it descends nearly half an inch. The pleura on the upper surface of the



Dissection of the retro-peritoneal space showing the relations of the perinephric tissue and kidney to the diaphragm, colon, nerves and vessels. The ilio-hypogastric and ilio-inguinal nerves, and the lowest limit of the pleura, though posterior to the kidney, are indicated by lines, in order to show the relation.

diaphragm is therefore in proximity to the upper posterior perinephric region and readily becomes, from contiguity of structure, involved in the inflammation.[1] Careful auscultation will often reveal slight friction sounds and evidences of local pleuritis in the vicinity of the 11th or 12th rib when no *symptoms* of this complication are present. Serous effusion, empyema, or purulent expectoration from rupture of the abscess into the

[1] Plate VIII. of Dwight's Frozen Sections of a Child, shows this relation beautifully.

bronchial tubes may occur later. Abscess in the upper part of the kidney region may cause dyspnœa from the swelling of the infiltrated tissues preventing perfect descent of the diaphragm. This symptom may be induced whenever there is much swelling accompanying perinephritis, but it would evidently occur sooner and with less enlargement in inflammation of the upper areas.

The position of the supra-renal gland makes it liable to involvement when the upper anterior tract is the seat of disease, but we have not sufficient knowledge of the function of this organ to connect any definite symptoms with such supra-renal pressure or inflammation. The vicinity of the solar plexus and semilunar sympathetic ganglia to the upper anterior tract suggests that such digestive symptoms, as have been mentioned (p. 393) in connection with perinephritis, would especially occur when the upper anterior region was the seat of the abscess. Unfortunately the symptomatology of the sympathetic nervous system is at present too little understood to aid us much in our present researches. On the right side abscess of the upper anterior tract could, if there was considerable swelling, interfere with the return circulation in the vena cava, and thus induce dropsy of both lower extremities. Large swelling about any portion of the front of the right kidney might effect this, but the upper extremity of the kidney approaches rather nearer the vein than the lower, and therefore œdema of the legs would occur with less advance of the disease in this location. The right semilunar ganglion would not be likely to suffer from pressure until after the vena cava had been involved because it lies beneath and to the inner side of the vein.

I do not think that pressure upon the common bile-duct would readily occur in perinephritis of the right side, unless the swelling of the renal envelope was very great. If such interference to excretion of bile occurred, jaundice would be a marked symptom, and would locate the disease in the upper tracts of the right kidney. Similarly situated disease of great bulk might interfere with pancreatic excretion, causing fatty stools, or by making pressure on the vena portæ cause ascites. It does not seem to me probable that perinephric abscess would often interfere much with these structures because they lie near the middle line, and much more anterior than the kidney. This organ is placed in the hollow formed by the ribs and vertebræ, while the semilunar ganglia, the bile and pancreatic ducts, and the vena portæ lie in front of the vertebral bodies.

The symptoms liable to occur when the middle tracts are invaded are albuminuria, with perhaps tube-casts, due to renal congestion from pressure on the renal vein; and suprapubic, scrotal or vulvar pain or anæsthesia on account of compression on the ilio-hypogastric and ilio-inguinal nerves. These symptoms are, I believe, less frequent when the abscess is in the anterior middle tract than in the posterior middle tract, because there is opportunity for the tumefaction to extend forward and relieve

the venous and nervous compression. Moreover, the nerves are too far behind to receive much pressure from anterior abscess. Hence if albuminuria and scrotal pain were present I should diagnosticate disease in the posterior middle tract; while if albuminuria existed without scrotal pain, neuralgia or anæsthesia, I should suspect anterior middle inflammation. Previous albuminuria must necessarily be excluded, to render the symptom of value in perinephric localization.

A higher degree of compression, particularly from posterior middle disease, would be liable to compress the pelvis and ureter, but symptoms of suppression of urine or uræmia would not be exhibited if the other kidney worked effectively. Actual inflammatory involvement of the pelvis or ureter would reasonably lead to the exhibition in the urine of pus in very moderate quantity.

Abscess in the anterior middle tract might cause scrotal œdema or even varicocele from obstruction to venous return in the spermatic vein. This would be more likely on the left side where the spermatic vein comes nearer the kidney by reason of emptying into the renal vein.

Perinephric inflammation about the lower portion of the kidney gives rise to an effect which is much more noticeable than any other consecutive symptom of perinephritis. This is flexion of the thigh due to spasm of the psoas and other flexors of the hip-joint on account of involvement of the anterior crural nerve. At the same time there may be anæsthesia or neuralgia of varying areas of the inner, anterior, or outer surfaces of the thigh from involvement of the sensory fibres of the genito-crural, external cutaneous, and anterior crural nerves. Retraction of the testicle will probably be present if the genito-crural nerve is implicated, because it supplies the cremaster muscle. This lifting of the testis indicates therefore a higher location of the abscess than when the hip-flexion exists without this accompaniment. A mere momentary retraction of the testicle which may arise from reflex irritation of various kinds is of no significance. Prolonged retraction would be the valuable symptom.

I believe the hip-flexion to be due to nerve compression rather than to a myositis of the psoas, because complete voluntary and passive extension is regained after recovery from the abscess, and also, in my opinion, after the pressure is relieved even before complete recovery. If inflammation of muscle existed I should expect a more or less permanent contracture. Pain at the knee may occur from pressure on the obturator nerve and possibly from similar involvement of the anterior crural which is also distributed to the knee. As these nerves both arise from the 3d and 4th and the branch from the 2d and 3d lumbar nerves, it does not matter by which one the pain is transmitted.

These symptoms I should expect to be developed earlier and more frequently in inflammatory exudations in the posterior than in the anterior lower tract. The reasons are that there is less room for expansive swell-

ing, and that all the nerves lie deeply under the psoas. The genito-crural and external cutaneous nerves come to the anterior and lateral surfaces of the psoas at distances from the kidney, varying in different subjects. The external cutaneous lying laterally is better protected than the genito-crural. Hence abscess in the anterior lower tract by extending downwards might involve these nerves in some cases when not extensive enough to do so in others. Posterior abscess as stated above, is of course much more liable to do so, and it can compress the nerves at a higher point, where they are still buried in the muscular mass of the psoas which lies beneath and to the inner side of the kidney.

Exudative inflammation at the lower part of the perinephric region may press upon the ilio-hypogastric and ilio-inguinal nerves, as in the middle tract, but at a lower point in the course of the nerves. In this event, however, the scrotal neuralgia and other symptoms due to such compression would not be accompanied by albuminuria from obstruction of the renal vein. In this instance, again, posterior disease, or at least disease at the lower extremity rather than in front of the kidney, would be most likely to give these resultant symptoms.

The duodenum lies behind the peritoneum, and crosses the spinal column at about the level of the lower anterior tract. Hence lesions in this tract on the right side might, by compressing this portion of intestine, cause obstruction, persistent vomiting, and rapid emaciation from non-assimilation. Abscess of the anterior middle tract could, perhaps, cause similar pressure.

In all cases it must be recollected that the right kidney usually lies about three-quarters of an inch lower than the left.

By burrowing of pus downwards symptoms of perityphlitis may be developed secondarily, and cause unilateral œdema from pressure on the external iliac vein. Abscess and sinus in the region of Poupart's ligament may be symptoms of perinephritis of the lower tracts. Anterior lower abscess of the left side is liable to produce constipation from pressure upon the descending colon, which, as shown in the cut from one of my dissections, is attached by the mesocolon over the lower half of the kidney. This is not so on the right side, where the ascending colon becomes free from the posterior wall just as it touches the inferior extremity of the kidney region, or perhaps extends upon and is fastened to only the very lowest part of its anterior surface.

It is barely possible that a large abscess of the right anterior lower tract might extend forward to the front of the spine, and compress the chyle reservoir, which lies in front of the second lumbar vertebra and to the right side and partly behind the aorta. The aorta would render such complication from the left perinephritis more difficult of consummation. Rapid emaciation would be expected as a result of such an unusual and quite unlikely complication.

I shall, in concluding this section of my subject, group in tabular form the more important deductions from my anatomico-clinical study.

A Table of the Symptoms of Probable and Possible Value in Localizing Perinephritis and Perinephric Abscess.

All anterior regions.—Pain, tenderness, swelling, œdema, and pointing in front and side of abdomen.

All posterior regions—Pain, tenderness, swelling, œdema, and pointing in loin.

Upper tracts.—Pleuritic friction, pleural effusion, empyema, expectoration of pus; dyspnœa; suprarenal involvement; solar plexus involvement. (On right side.) Bilateral œdema of legs; jaundice; fatty stools; persistent vomiting; rapid emaciation; ascites.

Middle tracts.—Albuminuria and casts; suprapubic, scrotal, or vulvar pain or anæsthesia; suppression of urine; uræmia; pus in the urine; œdema of scrotum or varicocele (especially on left side).

Lower tracts.—Flexion of hip; pain or anæsthesia of front, inside, or outside of thigh; retraction of testicle; pain at knee; scrotal or vulvar pain or anæsthesia, without accompanying albuminuria; unilateral œdema of legs; abscess or sinus near Poupart's ligament; constipation (if left side); involvement of chyle receptacle (if right side).

In deciding upon the point of operation, after a diagnosis of the locality of the abscess has been made, the surgeon must bear in mind the relation of the kidney to the bony landmarks. The upper border of the organ corresponds very nearly with the space between the eleventh and twelfth dorsal spines. The lower extremity of the kidney is about on the level of the third lumbar spine. The vessels and pelvis of the kidney correspond with the level of the first lumbar spine. The right kidney lies a little lower than the left. The eleventh rib marks with considerable accuracy the upper edge of the kidneys. The right kidney has its top nearly on a level with the lower border of that rib, while the left has its upper end about on a level with the upper margin of the same rib. The kidney is about two inches wide, and lies with its inner border quite close to the vertebral bodies.

Prognosis.—A few cases of perinephritis recover without going on to suppuration. The percentage of such results is not obtainable. Gibney gives a good many such instances, of which one was of six months' duration. When suppuration occurs the prognosis is good if early evacuation is accomplished spontaneously or by the surgeon's incision. When the pus is allowed to burrow, prolonged suffering, hectic fever, and often death are the consequence. A fatal issue is certain under such circumstances,

unless the pus is finally discharged through some opening. Incision, of course, greatly hastens recovery.

Treatment.—During the early stages, counter-irritation to the loin by iodine and blisters may be employed. The frequent application of the hot-water douche has apparently been beneficial. Morphia, and similar remedies, and laxatives will usually be required.

When resolution does not take place, and there are evidences of a deeply seated posterior abscess forming, the proper treatment is early incision in the loin over the kidney. When the skin and deep fascia have been incised, the muscles, which may or may not be softened, can usually be torn through with the finger. By boring with the finger to the depth of two or three inches the surgeon will probably strike the pus cavity. If not, the free opening thus made will allow an early evacution of the pus which will soon find its way to the wound. The finger is a better instrument than the knife, because the tearing apart causes little bleeding, and the finger can appreciate the direction of the pus by the friability of the muscles. If preferred by the operator, a grooved director may be pushed into the tissues, and a pair of dressing forceps slipped along this into the softened structures. By separating the blades, and withdrawing the forceps with the blades apart the surgeon can tear open the abscess without much risk of hemorrhage.

Anterior abscesses may be aspirated or incised from the lateral or anterior aspect of the abdomen. When small, their treatment will be greatly complicated by the relation of the peritoneum and intestines. Poland has tabulated,[1] chiefly, but not entirely, from Trousseau and Bowditch, 28 cases of perinephric abscess which he considers primitive; that is, not due to pyelitis, calculous nephritis, or like causes. Of these, in 8 cases no operation was done; in 5, more or less satisfactory attempts at operative evacuation were made by puncture with the trocar and canula, or by applying caustic potassa; and in 15, free incision was adopted. Death took place in 6 of the 8 cases left to nature's efforts, in 1 of the second group, and in 1 of the 15 cases treated by incision.

Bowditch, in 1870, especially insisted upon early incision. The reasons for such surgical action are at the present day so patent and so universally accepted that it is unnecessary to dwell upon the point.

After incision, free drainage, antiseptic affusions and poultices are proper.

[1] British and Foreign Medico-Chirurgical Review, 1871, vol. ii. p. 235.

ARTICLE VII.

A CASE IN WHICH DIVISION OF THE FEMUR BELOW THE TROCHANTERS WAS PERFORMED SIMULTANEOUSLY ON BOTH SIDES FOR ANGULAR ANKYLOSIS OF THE HIP-JOINTS FOLLOWING COXALGIA.

By JOS. C. HUTCHISON, M.D., L.L.D., of Brooklyn, N. Y.[1]

ONE of the most important achievements in the surgery of deformities made in recent times is that of subcutaneous division of the neck of the thigh-bone, for distortion of the hip-joint, by Mr. W. Adams, of London, and the modifications of his operation by Mr. Gant and the late Mr. Maunder. The success which has attended the operation, both here and abroad, has established it as a legitimate surgical procedure.

Mr. Adams says that the cases most favourable for his operation are those of a rheumatic or pyæmic origin.

> "Because in these affections there is no loss of bone-structure, and the head and neck preserve their integrity; but in the so-called strumous class—unfortunately much the longest—there is generally more or less destruction of the head of the bone, and other alterations in the anatomical relations of the joint; only the most favourable of this class should therefore be selected; but for the remaining cases in which my operation is not applicable, Mr. Gant's operation will be found to succeed."

Mr. Adams draws the skin to one side and enters a tenotomy knife just above the top of the great trochanter, and carrying it straight down to the neck of the thigh-bone, divides the muscles, and opens the capsular ligament freely. Withdrawing the knife, the skin still being held to one side to keep the track straight, a saw rather more than a quarter of an inch in width, with a cutting edge an inch and a half in length, at the end of a blunt shank three inches in length, is carried along the track made by the knife, straight down to the bone, which is sawed through from before backwards.

Mr. Gant's operation consists in dividing the shaft of the femur subcutaneously, just below the small trochanter, with instruments similar to those employed by Mr. Adams. It is applicable to the cases referred to by Mr. Adams, where his operation would be inapplicable, as in ankylosis following hip-joint disease, where the head and neck of the bone has disappeared, and in ankylosis resulting from rheumatic arthritis attended with large nodular deposits of new bone around the neck, making it difficult, if not impossible, to divide the bone in this situation. Infratrochanteric osteotomy has the additional advantage that the psoas and iliacus muscles are released, and the malposition of the limb is completely overcome.

Mr. Maunder's operation is in the same situation as Mr. Gant's, and is applicable to similar cases; but he divided the bone with Volkmann's

[1] Read before the New York Surgical Society.

chisel, and probably did not make a subcutaneous section of the bone. Each operation has its appropriate sphere. Section of the neck of the bone (Adams's operation) should be selected where the pathological conditions permit it, because being nearest the centre of motion, the formation of a movable joint here allows more freedom in the movements of the limb.

Maunder's operation was selected in the case I am about to describe, because section of the neck of the bone was inadmissible on account of the altered state of the parts. The object of the operation was merely to straighten the limbs. I divided the bone with Macewen's osteotome, which I find is a better instrument than the chisel, and preferable to the saw, because it lacerates the soft parts less and divides the bone much quicker.

CASE.—J. C. A., aged 13 years, entered the Brooklyn City Hospital, November 11, 1881, for the relief of complete ankylosis, with angular deformity, of both hip-joints.

When three and a half years old, he fell upon the right trochanter, but experienced no inconvenience from it at the time. Six weeks subsequently, he began to complain of pain in his right knee, growing worse at night, and to drag his right foot in walking, which he did by leaning upon chairs and tables. An apparatus of some kind was applied, which enabled him to walk better, and his pain was less; but owing to the inconvenience and discomfort it gave him, crutches were substituted. Abscesses subsequently formed about the hip-joint, and he was confined to bed. A year and a half after the right hip became affected, the same trouble began in the left, without any history of injury. For a year subsequently he was confined to bed. Numerous abscesses formed around the joints, and a good many pieces of bone were discharged from both sides. The right side was always the worst. He improved, and moved about the house on his hands and knees for a year or two, and then used crutches and again went to school.

When he came under my observation he had entirely recovered from the morbus coxarius, and entered the hospital to be treated for the resulting deformity. His mother died with phthisis, and several other members of the family were victims of the same disease. When he entered the hospital his general health seemed to be good, but his aspect was not that of a vigorous boy. There was very marked lordosis in the lumbar region, which was completely removable when he sat down, showing a greatly increased flexibility of the spine. The lordosis also disappeared when he was on his back, and both thighs were brought up nearly to a right angle with the spine. The right thigh was a little more flexed than the left; both were adducted; the right was rotated inwards, and the right knee overlapped the left. The right heel rested upon the toes of the left foot, and the left shoe was worn by the pressure of the left foot upon it. The left knee-joint was normal; the right could be fully flexed, but owing to contraction of the flexor muscles, it could not be fully extended. Not the slightest flexion, adduction or abduction, could be made in either hip-joint; the entire body could be raised from the bed by merely raising one or the other heel, without developing the least motion at the hips. There were old scars behind both trochanters and at the left sacro-iliac junction, mark-

ing the openings of former abscesses. The top of the left trochanter major was one and a quarter inches and that of the right three-quarters of an inch above Nélaton's line. Distance from the anterior superior spine of the ilium to the lower border of the patella, on the right side, twelve and a half inches; on the left, thirteen inches. He moved about the ward in a crouching attitude, leaning on chairs and tables, and was able to go out of doors with the aid of crutches. His attitude is shown in Fig. 1.

Fig. 1.

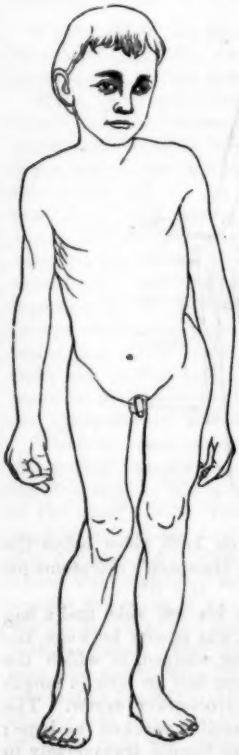
November 11, 1881, I performed osteotomy on both sides below the trochanter minor, in the following manner, using Macewen's osteotome for dividing the bone:—

The patient was etherized, and turned upon his left side, and a bag filled with wet sand, as suggested by Macewen, was placed between the upper part of the thighs to form a firm resisting surface, in which the right thigh was imbedded. A longitudinal incision half an inch in length was made directly to the bone, just below the trochanter minor. The osteotome was slipped by the side of the scalpel until it reached the bone; the scalpel was then withdrawn, and the osteotome turned transversely in the direction required for the osseous incision. By a few strokes with a mallet the bone was penetrated to the hard layer on its inner aspect, which was notched by the osteotome and then snapped. During the operation the wound was constantly irrigated by squeezing from a sponge a solution of carbolic acid, one drachm to the quart. The thigh was brought down to

a straight position and was freely moved in all directions, while a carbolized sponge was applied to the wound; but in order to fully overcome the adduction and internal rotation, it was necessary to divide subcutaneously the tensor vagina femoris, pectineus, and adductor longus. The wounds were dressed with Lister's protective, dipped in the above solution of carbolic acid, and covered with marine lint and a bandage. The wound made for the chisel was not closed, but blood was effused between its lips, and formed clots which subsequently became organized.

The left femur was divided in the same manner, and the same dressing was applied; the left adductor longus and pectineus were also divided. There was very little hemorrhage from the incisions. The contracted right knee was forcibly extended, and the limbs were brought into a straight position. The divided ends of the bones were placed in apposition, but there was some angular inclination forward, especially on the right side, where flexion had been most marked.

Fig. 2.



The patient was put to bed, and extension made on both sides by weight and pulley—seven pounds for three weeks and four pounds for two weeks longer. Firm union had then taken place on the left side, but there was slight motion at the point of section of the bone on the right side. He was kept in bed a week longer. During the extension, the feet were separated eighteen inches, and were prevented from rotating inwards by sand-bags applied along the inner side, extending upwards to the lower third of the thigh.

No reaction occurred. The temperature did not at any time rise above 99°, and he had no pain except when the limbs were moved. Two weeks after the operation the wounds were examined, and found to be entirely healed—covered with epidermis.

He was discharged from the hospital January 6, 1882, and his condition at that time is shown in Fig. 2.

The lordosis continues, but is slightly less marked than before the operation. There is some obliquity of the pelvis towards the right side. The lower extremities are straight, or nearly so; the thighs are slightly adducted, especially the right. He often uses a cane, but can get about very well without it. There is no motion at the hip-joints nor at the seat of the osteotomy, but there is considerable increase of mobility in the lower lumbar and sacro-vertebral joints. In walking on a level and in stepping downstairs, he puts his right foot forward. In going upstairs he turns his left side forward and steps up with his left foot first; this is due to the fact that the pelvis is higher on the left side. His mother says that he plays ball and engages in other outdoor sports, and manages to run pretty well.

I desire to call special attention to the fact that, in this case, the osteotomies were made by open wounds directly to the bone; it was not intended to make them subcutaneous. The osteotome was introduced and placed transversely across the bone in order to divide it, and consequently the external air was admitted directly to the interior of the bone. In eight sections of the femur which I have made, three were done with a rigid observance of Mr. Lister's antiseptic method, including the spray, and five with a modified Listerism, which consisted, as in the above case, of irrigating the wound with a weak solution of carbolic acid, one part to two hundred and fifty, during the operation, and then covering it with a piece of protective wetted with the solution, and over this a piece of marine lint, retained in position by a bandage.

This case has a certain amount of interest, from the fact that it is the only case, so far as I am informed, where osteotomy of the upper part of the thigh-bone has been done upon both sides simultaneously. The operation commends itself to the surgeon on account both of its simplicity and safety. The external wound behaves as well and heals as readily as a simple tenotomy; indeed, I have seen more local disturbance from an ordinary tenotomy than occurred in any of the eight osteotomies that I have performed on the femur.

ARTICLE VIII.

THE USE OF IODINE AS A STOMACHIC SEDATIVE. By THOMAS T. GAUNT, M.D., of New York.

THE employment of iodine for the relief of the vomiting of pregnancy has been somewhat in vogue for a number of years. And while the success attending its use has been pointed out with more or less enthusiasm by a number of observers,[1] its exact value has never been established, and so far as I have been able to ascertain, it is more often employed in actual practice, as a *dernier resort*, than as a remedy of much promise.

Some three years ago I began using small doses of the compound tincture of iodine as a stomachic sedative, and have gotten such satisfaction from its employment, that I have thought the appended cases might prove of possible interest to those in the medical profession who seek for more

[1] Eulenberg, *Med. Times and Gazette*, Nov. 1856, p. 527. Becquerel and Buisson, *Bull. de Thérap.* liii. p. 474. Masson, *Abeille Méd.* xiv. p. 268. Quoted by Stillé, Therap. and Materia Medica, 1860, vol. ii. p. 903. The National Dispensatory, Stillé and Maisch, 1879, p. 779. Treatise on Therapeutics, Trousseau and Pidaux, translation by Lincoln, 1880, vol. i. p. 158. Bartholow, Materia Medica and Therapeutics, 1878, p. 179.

reliable means of controlling persistent vomiting than the routine measures usually employed for the relief of this most distressing symptom. So far as I have been able to discover from a careful review of most of the standard works, iodine has not been put upon record as of value for relieving other forms of vomiting than that of the pregnant state.

The first occasion on which I used iodine as a stomachic sedative was in the following case.

CASE I. A woman, aged 50 years, had been suffering for two hours from severe vomiting which accompanied an acute indigestion. I ordered her three drops of the compound tincture of iodine, in a tablespoonful of water, every fifteen minutes until relieved. After taking the second dose the vomiting ceased, and before fifteen minutes more she was sleeping soundly. The following morning she awoke without the slightest feeling of nausea and was able to eat a hearty breakfast with relish.

I was so favourably impressed with the action of the remedy in this case that I decided to give it a further trial. The next suitable case which presented an opportunity for investigating its value, was the following.

CASE II. A woman, aged 43 years, had been suffering for a number of weeks from irregular rigors followed by a variable rise of temperature and profuse sweating. Annoying as these symptoms were, she considered them trifling when compared with the constant nausea and frequent vomiting from which she also suffered, and for the relief of which I saw her in consultation. We were at the time unable to make a diagnosis as to her general condition, but later, from the subsequent history, concluded that she was suffering from acute general miliary tuberculosis. Faithful efforts had been made to control the vomiting, both by a variety of drugs, and by so arranging her diet as might best conserve for the relief of this distressing symptom, which was depriving the patient of both food and sleep. I advised that she should be given five drops of the compound tincture of iodine every four hours. This was done, and in less than thirty-six hours she was relieved of both nausea and vomiting.

Following up these cases, in which iodine had given good results, I began to give this remedy in a large number of cases of vomiting from a great variety of causes. For example, I have used iodine in doses of from one to five drops, frequently administered, for the vomiting of phthisis. During the past year I have employed it over fifty times, and find it to give better results than any other remedy that I have seen used for this purpose. The following case is a fair example of the satisfaction which may be had from the use of small doses of iodine for relieving phthisical vomiting.

CASE III. A woman, aged 28 years, who had catarrhal phthisis which had advanced to the stage of excavation, had, for three weeks before I saw her, been suffering from almost constant vomiting, having been unable to retain even the simplest nourishment during this time, in consequence of which she had grown very anæmic, emaciated rapidly, and her other general symptoms had became much aggravated. I ordered her to have two drops of the compound tincture of iodine every fifteen minutes

until relieved. In less than two hours after taking the first dose the vomiting had ceased, and when I saw her again, at the end of one week, she was eating fairly well, was able to be about with comfort, and was withal better than she had been for a number of weeks previously.

This rapid checking of emesis, in a class of cases usually so difficult to control, is a fair example of the power possessed by iodine in checking vomiting, and it is easy to infer therefrom the comfort afforded patients, and the satisfaction one gets from the use of this drug in the vomiting of phthisis. In fact I have found iodine, in small doses, to exercise such a particularly salutary influence over phthisical vomiting, that I wish to record my belief that we have in it the most generally useful agent at our command for controlling this very distressing and obstinate symptom.

I have been able to check the annoying vomiting sometimes seen in hysteria, by drop doses of the compound tincture of iodine, as is shown in the following case.

CASE IV. A woman, aged 35 years, who had been subject occasionally to attacks of hysteria about the menstrual epoch. Two months previous to the present attack she had vomited for three weeks, commencing with the menstrual flow, and ending two weeks before the next period. During this time she had been confined to bed, and given various remedies without relief. She finally recovered after all medication had been discontinued. Six weeks after this, she again began to menstruate, and shortly after to vomit profusely. I gave her two drops of the compound tincture of iodine every one half hour, from which she said she experienced great relief, and in less than forty-eight hours she ceased vomiting completely.

We all know that conclusions based on the use of drugs in hysterical women are, as a rule, fallacious, and I only cite this as one out of several cases of hysterical vomiting in which iodine has afforded me much satisfaction.

The morning nausea and vomiting of drunkards, as well as the more persistent emesis, from which they often suffer after a prolonged debauch, have, in my experience, yielded more readily to small doses of iodine, than to any of the somewhat lengthy list from which selection is usually made.

CASE V. A man aged 45 years, who had been a hard drinker all his life, always after a prolonged indulgence suffered from annoying vomiting for several days. He consulted me while suffering from an attack of unusual severity. By giving him three drops of the compound tincture of iodine every hour, I was able to quickly stop his vomiting, and at the end of twenty-four hours he was feeling so well that he began again to drink as freely as before.

The foregoing is the last one of a long series of similar cases, and I cite it not as a striking illustration, but, because it has come under my care while writing this.

The vomiting we so frequently meet with in severe cases of septicæmia is very harassing to the patient, and renders the prognosis so much more

grave, that it behooves us to check it as quickly as possible. I have had several cases of septicæmia under my charge during the past few months, and have been greatly pleased with the control which small, frequently repeated doses of iodine seemed to exert over the symptom.

The results in the following case were particularly gratifying.

CASE VI. A woman aged 30 years; I was asked to take charge of this patient immediately after she had been operated on, and had her under my care for two weeks. The patient was suffering from phthisis and had been jaundiced for six months before the operation was done. The operation consisted in a resection of the right ankle. The details of the case have no interest for us here; suffice it to say, that, notwithstanding careful antiseptic treatment of the wound, the woman developed marked signs of septic poisoning, and before the end of a week had a temperature of 105°, and was rejecting everything swallowed. After trying to establish a tolerance of the stomach by a regulated diet and failing, I gave her one drop of the compound tincture of iodine every fifteen minutes. In less than six hours I was able to control the vomiting, and by means of an occasional dose of iodine kept the irritability of the stomach perfectly in check. At the end of the following week I delivered up the patient eating and sleeping well, with a temperature but slightly elevated and the wound doing finely.

I feel confident, that had it not been for the iodine which checked the vomiting, the patient would have been shortly reduced to a condition of extreme prostration. For judging by a large number of cases of septicæmia which I have seen, we can have but slight hope of checking the vomiting from the use of the routine anti-emetic remedies.

In the latter stages of chronic nephritis, where we so often encounter troublesome attacks of vomiting, I have used small doses of iodine with good success. The benefit obtained is often lasting, but I now and again came across a case where the administration of iodine has to be kept up for a considerable time, and later used whenever nausea and vomiting again supervene.

CASE VII. A man aged 55 years, has chronic diffuse nephritis, and is suffering from almost constant nausea and vomiting. Gave him two drops of the compound tincture of iodine every four hours. This checked the vomiting and relieved the nausea. By taking an occasional dose of iodine whenever vomiting threatened he was able to keep the irritability of his stomach in abeyance.

It would appear at first sight a doubtful expedient to give iodine in even comparatively small doses to patients with acute catarrhal gastritis. I have often given it in this condition, however, with the best satisfaction, as the following case may serve to illustrate.

CASE VIII. Man, aged 50 years, suffering from acute catarrhal gastritis. When I saw him he was having free, but somewhat painful emesis. I gave him one drop of the compound tincture of iodine every fifteen minutes, and had the pleasure of seeing the vomiting stop after he had taken three or four doses of the medicine.

But I do not intend to give examples of all the classes of cases in which I have used iodine as a stomachic sedative, for did I attempt this, I should be obliged to far exceed the limits I have proposed for this paper.

I will conclude with some half-dozen cases, chosen at random from a series of over one hundred cases of gastro-intestinal disturbance accompanied with vomiting which I have treated at the New York Dispensary, during the past summer, with drop doses of the compound tincture of iodine. The first case I will mention is one of gastritis with the following history.

CASE IX. Child, aged 5 years, had been suffering from great pain in epigastrium and constant vomiting, with marked increase of temperature, for forty-eight hours before I saw him. The pain and vomiting had deprived the patient of rest, and together with the increased temperature and impossibility of retaining food, or even water, had caused him to emaciate rapidly. He was greatly prostrated when I was first called to see him. I ordered him one drop of the compound tincture of iodine every fifteen minutes, and instructed the mother to allow him a few drops of a mixture of equal parts milk and lime-water, as soon as his stomach showed a tolerance of the iodine. At the end of two hours the medicine was retained, as was also the milk which was given in small but increasing quantities, and at frequent intervals. This child went on to rapid convalescence, and had no return of the vomiting after it was at first checked by the iodine.

The three following cases may serve to illustrate the results obtained from the use of iodine in some of the intestinal diseases of children.

CASE X. A child 1 year old, suffering from subacute duodenitis, was brought to me after the pain and pyrexia had nearly disappeared. The jaundice was still pronounced and the bowels quite relaxed. The child was greatly exhausted from the frequent and profuse vomiting which still persisted in spite of treatment by the usual remedies. I gave this child one-half drop of the compound tincture of iodine every one-half hour, and by this means speedily and permanently arrested the vomiting, after which the child took an abundance of nourishment and was soon restored to perfect health.

CASE XI. Child, aged 6 months, was suffering from acute gastro-enteritis, and because of inability to retain either food or medicine, was being rapidly undone by persistent emesis and diarrhœa. The child could be with difficulty roused, and would reject everything it could be induced to swallow. One-half drop doses of the compound tincture of iodine every one-half hour, in less than four hours arrested the vomiting, while, now that medicine could be retained, the diarrhœa was soon checked by appropriate treatment.

CASE XII. Child, 2 months old, was suffering from entero-colitis. Had been vomiting with but slight let up for five days. The contents of the bowels were passed involuntarily, and the exhaustion was extreme. The child was with difficulty roused, and, after rejecting one drop of the compound tincture of iodine every fifteen minutes for two hours, it finally retained the medicine, and at the end of another hour retained, without difficulty, a few drops of brandy and a mixture of milk and lime-water. These were increased while the frequency of administering the iodine was

diminished, and under the somewhat active stimulation and free administration of food speedily served to arouse the child's flagging strength. Appropriate treatment soon controlled the diarrhœa, now that medicine was retained, and the child was soon rapidly advancing toward recovery.

The following and final case of this series was the most serious case of cholera infantum which it has been my misfortune to encounter.

CASE XIII. Female child, aged 13 months, was brought to me in a state of collapse. It had been treated by a very skilful and successful practitioner before I saw it, but without avail. Stimulation or medication was impracticable because of the obstinate irritability of the stomach. Food had not been retained since the onset of the disease. I had it aroused somewhat by the application of heat to the surface of the body, and then gave it one-half drop of the compound tincture of iodine every fifteen minutes. At the end of two hours, brandy, together with lime-water and milk, were given in small quantities every five minutes and rapidly run up, the iodine and heat to the surface being continued. The child rallied rapidly and made a speedy recovery.

I treated in all some five hundred cases of gastro-intestinal troubles, during the past summer, and did not lose a single case. My treatment did not differ from that employed by a majority of my friends, excepting in the employment of iodine when vomiting threatened, and in the rigorous enforcement of what some neglect to make a cardinal necessity, namely, that in all the summer disturbances of children, all the milk should be boiled just before it is taken and diluted with one-half of its bulk of lime-water or less, according to the severity of the case. I make no apology for being thus explicit and detailed in mentioning what we all know theoretically so well, but which many neglect to practise at the bed-side as it should be practised.

I would say in conclusion, that I have yet found no satisfactory physiological explanation for the undoubted influence iodine in small, frequently repeated doses exercises over the symptom of vomiting. I do not doubt that anyone who will use iodine as I have pointed out, will be better satisfied with its action than they could possibly be with any of the conjectures which have presented themselves to my mind, as to its probable mode of operation.

I have, while writing this, heard of two cases in which the exhibition of iodine failed to check vomiting. They occurred in the practice of friends of mine, and were somewhat alike, at least, in two particulars. Both patients had been given ipecac. in small doses, before vomiting appeared, and in both, also, there was a large amount of mucus present in the stomach. The first was a case of vomiting following an overdose of opium, while the second was one of subacute catarrhal gastritis, in which the vomiting accompanied an acute attack of indigestion. Now it is not impossible that iodine may be incapable of exerting its influence, as an anti-emetic, when its administration follows that of ipecac.; this, how-

ever, is mere conjecture. There is one suggestion, however, I would like to make with reference to these two failures, and that is this, whenever iodine fails to afford relief, before abandoning it, let the patient have a free mustard potion, and when the stomach is cleansed by the vomiting which follows, then again exhibit the iodine, for we can easily imagine what a barrier to absorption is presented by the tenacious mucus which, in most morbid conditions of the stomach, thickly coats its lining membrane. It is well, also, to bear in mind the power possessed by starch in annulling the action of iodine. I must say, that by duly regarding these facts, during my quite extensive employment of the drug, I have not met with a single failure, in my own practice, from the use of iodine to control vomiting. I do not doubt, however, that I may, sooner or later, meet with instances in which this drug may prove impotent to relieve. In the event of my encountering a severe case of vomiting, in which there was present in the stomach an excess of mucus, and where the administration of an emetic, followed by the exhibition of iodine, failed to afford relief; I would not hesitate to pass the tube of a stomach-pump, wash out the stomach with an alkaline solution, and when the mucous membrane was thus thoroughly cleansed, I believe iodine, given in somewhat larger doses than already recommended, would afford excellent results.

In nasal catarrh, we are careful to cleanse the Schneiderian membrane before applying astringent solutions; why not, as well, that of the stomach, which we desire to place in as favourable an attitude for absorption as is possible? We can use this expedient without apprehension of harm resulting, in even the most severe cases, if we are sure that the strength of the stomach-wall is not impaired. The recent experiments, in France and elsewhere, with the forced feeding of phthisical patients, show how well so harsh a proceeding as the passage of a stomach-tube is borne, by even the most irritable stomach.

I prefer the following form for administration:—

℞. Tincturæ iodinii compositæ, ♏viij–℥ss.
Bismuthi subnitratis, ℥j–℈j.
Glycerinæ,
Aquæ cinnamomi, āā ℥iij.
Liquoris calcis, ad ℥ij.
M. et Sig.—Dose, one dessertspoonful.

The mixture is to be well shaken up before being taken. Give a dessertspoonful every fifteen minutes until the vomiting ceases. It may be objected that the bismuth and lime-water are the active ingredients in this formula. That this is not true, any one may prove to his own satisfaction, by studying the effect of the compound tincture of iodine, when given in drop doses dissolved in pure water. I find, how-

ever, that by using the above combination, the bismuth and lime-water help to allay the irritability of the stomach, and when they are given in conjunction with iodine, I think that the effects of the latter are more lasting, while the nausea is certainly controlled more quickly. Should intestinal disturbance also exist, the bismuth of course is still further advantageous. This prescription needs to be prepared anew every day, as the free iodine combines with the lime to form the iodide of calcium, on standing twelve hours.

Or, what will be found more convenient, have the above formula put up but omit the iodine, which is to be kept in a separate bottle, and the requisite amount dropped in the desertspoonful immediately before administration.

ARTICLE IX.

GASTROSTOMY, ŒSOPHAGOSTOMY, AND INTERNAL ŒSOPHAGOTOMY IN THE TREATMENT OF STRICTURE OF THE ŒSOPHAGUS.

By MORELL MACKENZIE, M.D. Lond., Senior Physician to the (London) Throat Hospital, and Lecturer on Diseases of the Throat at the London Hospital Medical College.

OWING to circumstances which it is unnecessary to analyze here, operations on the internal organs of the body have become much more common than they were formerly, and in recent years the stomach has been very frequently operated on with the view of counteracting the effects of œsophageal obstruction. It will probably appear to many that the time has now come when the various methods may conveniently be described, and their relative merits and drawbacks compared. The three operations which we have to consider are gastrostomy, œsophagostomy, and internal œsophagotomy.

Gastrostomy has been the most frequently practised, and will probably be proved to be the most valuable of all the operations for the relief of œsophageal stricture.

History of the Operation.—Gastrotomy, for the extraction of foreign bodies, has been practised since the sixteenth century, but gastrostomy, or the establishment of a "mouth" in the stomach, for the purpose of feeding a patient who is unable to swallow, was first proposed and fully described by Egeberg,[1] a Norwegian surgeon, in 1837. It was, however, actually carried out for the first time in France by Sédillot,[2] in 1849. After him it was performed by Fenger, Cooper, Forster, Sydney Jones, Curling, Bryant, Van Thaden, myself, Troup, Durham, Fox, Maury, Low, MacCormac, Jouon, Smith, Clark, Mason, Jackson, Rose, Möller,

[1] Memoir read before the Med. Soc. of Christiania, May 8, 1837.

[2] Gazette Médicale de Strasbourg, 1849, p. 366.

Jacobi, Hjort, Küster, Tay, Heath, Verneuil, Callender, Schönborn, Lanelongue, Courvoisier, Trendelenburg, Le Dentu, Riesel, Messenger Bradley, Studsgaard, Langenbuch, and Langton. The details of all the operations performed by these surgeons may be found in an elaborate treatise published by H. Petit[1] in 1879. Since the appearance of that work cases have been reported by McCarthy,[2] Littlewood,[3] Pye-Smith,[4] McGill,[5] Morris,[6] Buchanan,[7] Escher,[8] Milner Moore,[9] Lücke,[10] Gritti,[11] Kroenlein,[12] Bryant,[13] Langton,[14] Golding-Bird,[15] Reeves,[16] Kappeler,[17] Anders,[18] Fowler,[19] Bugantz,[20] Elias,[21] Maydl,[22] and Hume.[23] Several cases have been operated on by Howse and Davies-Colley, but the details have not been published.

The following is the best mode of operative procedure: The patient having been placed on his back, and an anæsthetic having been administered, the surgeon should first try to map out by careful percussion the situation of the stomach. The area of stomach-resonance varies somewhat in different individuals, and also in the same person according to the condition of the viscus itself. In those who have been suffering for some time from partial starvation, the organ is apt to be retracted so as to be altogether covered by the inferior margin of the thorax. To obviate any difficulty from this source the stomach has sometimes been successfully inflated with air before the operation, or ether has been pumped into the viscus from the mouth, or gas has been generated within the organ itself by the administration, first of hydrochloric or tartaric acid, and shortly afterwards of bicarbonate of soda.[24] When the stricture is not

[1] Traité de la Gastrostomie, Paris, 1879.
[2] Ibid., 1879, vol. ii. p. 466.
[3] Lancet, 1879, vol. i. p. 475.
[4] Trans. Inter. Cong., 1881, p. 456 et seq.
[5] Ibid., 1881, vol. ii. p. 942.
[6] Ibid., 1881, vol. ii. p. 873.
[7] Ibid., 1881, vol. i. p. 7.
[8] Centralblatt f. Chirurgie, Leipzig, 1880, vii. p. 625.
[9] Lancet, 1879, vol. ii. p. 425.
[10] Med. Times and Gaz., 1880, vol. ii. p. 187.
[11] Gazzetta Med. Ital. Lombardia, 1881, serie viii. t. iii. p. 3.
[12] Centralblatt f. Chirurgie, 1881, p. 16.
[13] Lancet, 1881, vol. i. p. 572.
[14] Brit. Med. Journ., July 15, 1882.
[15] Clin. Soc. Trans., vol. xv. 1882, p. 33 et seq.
[16] Ibid., p. 26.
[17] Deutsche Zeitschrift f. Chirurgie, Bd. xvii. Heft 1 and 2, 1882.
[18] St. Petersburg Med. Wochenschr., 1882, xvii. p. 185 et seq.
[19] Ann. Anat. and Surg., Brooklyn, New York, 1882, vi. p. 27 et seq.
[20] Quoted by Maydl, Wien. Med. Blätter, 1882, No. 22, p. 682.
[21] Deutsche Med. Wochenschr., Berlin, 1880, vi. p. 329–333.
[22] Wien. Med. Blätter, 1882, Nos. 15, 16, 17, 18, 19, 21, 22, 23, and 24. Twelve cases are here reported by Maydl, but the actual operator in six of them was Albert.
[23] Lancet, Dec. 23, 1882, p. 1074.
[24] Schönborn (Archiv. von Langenbeck, vol. xxii. p. 500) fitted an India-rubber ball to the end of a fine hollow sound, which he passed down the gullet. When the ball was in the stomach, it was inflated by blowing down the tube. Felizet (Lancet, Oct. 7, 1882), in a case in which he had lately to open the stomach for the removal of a foreign body, passed a small India-rubber tube through one of the patient's nostrils into the

impermeable, any of these plans may be of service, but none of them are necessary.

Gastrostomy should always be done with the strictest antiseptic precautions. There are three stages in the operation: 1, to open the abdominal parietes; 2, to transfix the stomach and secure it to the edges of the wound in the abdomen, and to the integument; and, 3, to open the stomach. Between the second and third stages it is most important that some days should elapse.

1st Stage. An incision should be made through the skin for a distance of two or three inches parallel to the left costal margins and about one finger's-breadth to their inner side; the centre of the incision being made to fall about three-quarters of an inch internal to the outer edge of the rectus. The lips of the skin wound should then be held asunder, and the fibres of the rectus should be divided in a vertical direction for about an inch, all hemorrhage being at once checked by torsion of the vessels, or ligature with fine carbolized catgut. When the parietal peritoneum is reached, it should be gently picked up with forceps, and a minute opening should be made in it with the knife. Through this aperture a grooved director should be introduced, on which the membrane is to be slit up in the axis of the incision through the rectus. The peritoneal sac being thus laid open, the stomach will in most cases be at once visible, but sometimes instead of it the omentum, or even the colon comes into view. The former is not likely to mislead the operator, but as it has actually happened that the colon has been opened instead of the stomach, it is well to be on guard against such an accident. The longitudinal bands, together with the *appendices epiploicæ*, and the thinness of the walls will serve to identify the colon, which should be gently pushed downwards out of the way. Should the omentum present itself in the wound, gentle traction should be made until the stomach is brought down so as to bulge out somewhat like a hernia.[1]

stomach. The proximal extremity of the tube was connected, by means of a piece of tubing, with a recipient containing ether. When the patient was fully under chloroform, the ether-holder was plunged into a vessel of water, at a temperature of 60° Centigrade, when the stomach at once became distended by the vapour. It is obvious that neither this nor Schönborn's plan could be pursued if the gullet was much narrowed. Jacobi (New York Med. Journ., 1874, vol. xx. p. 142) passed a fine catheter into the stomach, and injected a solution of bicarbonate of soda, and shortly afterwards a solution of tartaric acid. Fowler (Annals of Anat. and Surgery, Brooklyn, 1882, vol. vi. p. 27) injected thirty drops of dilute hydrochloric acid, mixed with an ounce of water, followed, after an interval of from two to three minutes, by an ounce of a saturated solution of bicarbonate of soda.

[1] Some surgeons prefer to make a vertical incision along the outer margin of the left *linea semilunaris*, commencing immediately below the edge of the thorax, and continued downwards for three or four inches. The incision through the rectus, as recommended above, was first practised by Mr. Howse, to whom the greater success of gastrostomy in recent years is largely due. The straight fibres of the rectus form a sphincter round the gastric wound, and the dribbling of the contents of the stomach so prone to occur during coughing is thereby prevented.

2d Stage. To keep the stomach in a proper position and prevent its falling back into the abdominal cavity during the remaining steps of the operation, the base of the projecting portion should be transfixed in a direction parallel to the surface of the belly by two long needles, the extremities of which should reach considerably beyond the edges of the wound on either side.[1] The stomach is thus held fast between two transverse supports resting on the surface of the body. The viscus should now be stitched to the abdominal wall either by a single or a double series of sutures. Verneuil uses one set of stitches, the sutures, which are of silver wire, being passed first through the skin close to the edge of the wound, next through the parietal peritoneum, lastly through the peritoneal and muscular coats of the stomach, and out again; the ends are then threaded through a perforated plate, and afterwards through shot drilled with a hole for the purpose, when they are fixed by crushing the leaden ball over them with pincers. Howse, on the other hand, prefers a double circle of stitches; the outer, which consists of carbolized silk sutures, passes through the serous and muscular tunics of the stomach, and afterwards through the skin about three-quarters of an inch beyond the lip of the wound, and is here tied over pieces of quill; the inner circle is made with ordinary sutures of fine wire or carbolized silk, and unites the serous coat of the viscus to the skin close to the edge of the incision. The object of the two circles of stitches is to provide a greater area for adhesion, the whole of the zone between the two circles being likely to unite with the abdominal parietes.

3d Stage. It is most important to delay this till adhesions have been produced between the corresponding peritoneal surfaces round the wound, and the stomach thereby securely fixed to the abdominal wall. Mr. Howse's method is to defer the third step of the operation till the fifth or sixth day, and by some surgeons[2] an interval of a week or even a fortnight is allowed to elapse between the preliminary part and the completion of gastrostomy. The stomach may be opened by puncturing the centre of the exposed portion with a fine-pointed bistoury. As considerable hemorrhage has followed this apparently simple proceeding on more than one occasion, the surgeon should be prepared for such a contingency, the occurrence of which is probably favoured by the congested condition of the islet of stomach-wall included within the ring of sutures. Pressure will probably suffice to stop the bleeding, or the risk may be altogether avoided by opening the stomach with a thermo-cautery point, after the manner of Albert. An India-rubber tube, provided with a plug, may be left in the wound, and kept *in situ* by means of a silver suture, passing through it and the skin on each side, or, as is Mr. Howse's practice, the

[1] This plan was first recommended by Verneuil (Bull. de l'Acad. de Méd., 1876, p. 1025).

[2] Maydl, loc. cit. No. 15, gives two cases where the interval was fourteen days.

fistulous opening, which is at first made only large enough to take a No. 6 catheter, may be gradually dilated to the size of a No. 32 instrument (French scale). In either case the wound should be dressed with a pad of lint steeped in carbolized oil (1 in 60), and an additional pad of boracic lint, the whole being kept in place by means of a body-bandage. The sutures should not be removed for about ten days.

In the interval between the second and third stages of gastrostomy the patient's strength should, if possible, be maintained by rectal alimentation. If the patient, however, has suffered from aphagia for more than two or three days, it may be necessary to do the entire operation in one act.

A few words must be added regarding the manner of feeding the patient after the completion of the operation, as the success of gastrostomy greatly depends on this. Nourishment should be given in small quantities and at very frequent intervals, and during the first few hours it should be given cold or even iced, in order to check vomiting. The act of feeding should, in as far as possible, be an imitation of the natural mode of taking food, that is to say, nourishment should be given in small spoonfuls, about half a minute being allowed to intervene between the helpings. The cause of failure after gastrostomy has undoubtedly sometimes been the unphysiological mode in which the food has been administered. At first the diet should be confined to milk, beef-tea, and a little stimulant: later on, when the stomach has become more accustomed to the novel conditions under which it has to work, light puddings of tapioca or arrowroot, hot milk sweetened with sugar, eggs boiled very soft, beef-tea, and chicken-broth may be allowed. Pounded meat or panada may be given when the patient's power of digestion is established. Trendelenburg[1] advises that the patient should, if possible, masticate the food, and should then blow it through an elastic tube passing from his mouth to the permanent tube in the gastric fistula. The patient has thus the enjoyment of eating, and the digestive process has the advantage of the salivary function.

Many operators have noticed that after gastrostomy the œsophageal stricture yields a little; this is probably due to relaxation of the muscular spasm, and subsidence of the inflammation which almost invariably affects the mucous membrane near the seat of the disease. Hence a day or two after the establishment of the gastric fistula, a little liquid food can often be swallowed. In this way the feeding through the stomach may be minimized at first, and that organ gradually habituated to the abnormal method of receiving nutriment.

The operation has been done sixty-seven times for cancer of the gullet, twelve times for cicatricial stricture, and twice for syphilitic stenosis. In a series of seventy-six cases of gastrostomy of which I have been able

[1] Archiv. von Langenbeck, 1878, vol. xxii. p. 227.

to obtain sufficient details, the total number of deaths occurring within a fortnight was fifty-five, *i. e.*, 72.4 per cent.

In the case of malignant disease the average duration of life after the stomach was opened was rather more than twenty days, the longest period of survival having been six months, and the shortest twelve hours. On looking more closely into the matter, however, it is plain that the results of this operation are progressively growing more favourable. Thus, in thirty-five cases collected by Petit, and extending over a period of thirty years, the average survival of the patient after gastrostomy for œsophageal cancer was slightly more than fourteen days and a half, whilst in thirty-two cases in which the operation has been done for the relief of the same disease within the last three years, the average subsequent duration of life has been more than thirty days. This estimate does not include Howse's cases, which have been alluded to by several surgeons as amongst the most successful operations of the kind that have been performed. It should be added that in fifty-seven cases of which a sufficiently detailed account is given, the average duration of the symptoms at the time of the operation, was about six months and a half, the longest being three years, and the shortest six weeks.

In twelve cases in which gastrostomy has been done for cicatricial stricture, the average of after-life has been more than five months and a half, not including a case of Bryant's, where the result is simply indicated as "cure," without further details. In these cases the average duration of symptoms at the time of the operation had been rather more than five months, the longest period having been one year, and the shortest four weeks.

Lastly, in two cases in which this operation was done for syphilitic stenosis, the average survival was slightly over three days, whilst the average duration of the symptoms had been seven months and a half.

In a total number of eighty-one gastrostomies death from shock occurred within forty-eight hours in twenty-seven, *i. e.*, in 24.6 per cent.

The *advantages* of gastrostomy are:—

1st. That it can be carried out with comparative *ease*.

2dly. That there is very little *risk* in the steps of the operation itself, especially if done in two acts separated by a proper interval of time.

3dly. That there is almost entire certainty[1] of being able to effect the object aimed at, which is the establishment of an alimentary fistula altogether beyond the seat of stricture.

4thly. That the fistula is hidden from sight.

The only *disadvantage*, on the other hand, is that gastrostomy, with

[1] See, however, two cases reported by Maydl (loc. cit.) where the operator was foiled by finding in one a large growth in the stomach itself, and in the other a cancerous condition of the fundus and anterior wall of that organ in addition to the œsophageal disease.

every aid of antiseptic precautions in the actual performance of it, and the improved after-treatment which is now adopted, still yields a high percentage of deaths.

ŒSOPHAGOSTOMY is an operation about which much less is generally known. In dealing with the history of it, therefore, it will be desirable to give a short commentary on all the cases hitherto treated by this method.

History of the Operation.—The establishment of a fistulous opening in the neck for the relief of stricture of the œsophagus appears to have been first suggested by Stoffel.[1] The first recorded instance, however, in which the operation was performed is one briefly alluded to by Tarenget[2] in 1786. The operator's name has not been preserved, but the case was more successful than any of those which have been done since. The patient was a woman suffering from what would seem to have been cancer of the gullet, and in spite of the fact that the cervical and submaxillary glands were already enlarged at the time of the operation, she survived for a period of sixteen months, during which she was fed through the fistula. More than half a century later, Watson[3] published a case of what he calls tubercular stricture, in which he opened the gullet. The disease, however, was probably malignant, as there were no signs of tubercle in the lungs. The patient—a young man, aged twenty-four—lived two months after the operation, and died of œdema of the glottis, for which tracheotomy had to be done. The thyroid body was greatly enlarged, but does not appear to have pressed upon the gullet. Soon afterwards Lavacherie[4] operated on a man, aged sixty-eight, suffering from what was probably a cancerous stricture of the œsophagus. This case is of somewhat doubtful character, as the cutting operation appears to have been undertaken mainly, if not solely, for the extraction of an ivory tube which had been passed into the stricture and could not be withdrawn. The gullet was opened, and the patient was fed through a tube, but it is not clear whether this was introduced through the wound or through the mouth. The patient died on the fifteenth day. Œsophagostomy was successfully performed by Monod[5] on a woman suffering from cancerous stricture of the upper part of the food-channel. She survived the operation three months, and died from the inevitable progress of the disease. In 1853 Follin[6] published a monograph on stricture of the gullet, wherein he advocated œsophagostomy in suitable cases. Richet[7] states that he performed the operation for

[1] Bonet, Sepulchretum, Lugduni, 1700, lib. iii., sec. iv., obs. xx. p. 35.
[2] Journ. de Méd.-Chir. et Phar., 1786, t. lxviii. p. 250.
[3] Dublin Journ. of the Med. Sciences, 1845, vol. xxvii. p. 260.
[4] Bull. de l'Acad. de Méd. Royale de Belgique, 1845, t. iv. p. 758.
[5] Quoted by Follin, Rétrécissements de l'Œsophage, Paris, 1853, p. 116.
[6] Ibid., p. 125.
[7] Traité Prat. d'Anat. Méd.-Chir., 2e éd., 1860, p. 508.

impermeable narrowing of the gullet opposite the second dorsal vertebra; the canal was opened, and a sound passed through the stricture and left *in situ*. Unfortunately, no further details are given, either as to the result of the case or the nature of the disease. In 1859, Bruns[1] reported the case of a man, aged thirty-eight, suffering from dysphagia, on whom he operated. The patient lived ten days, and, after death, the cause of the complaint was found to be compression of the œsophagus by an enlarged thyroid. A somewhat similar case was related by the same surgeon[2] in 1865. The patient was a man, aged thirty-seven, who had been afflicted with difficulty of swallowing for a year; œsophagostomy was done, and the man died five weeks later. In this case, as in Watson's above related, death was due to pulmonary disease and to œdema of the larynx, which made tracheotomy necessary. The thyroid was found to be somewhat enlarged, and a vast abscess with gangrenous walls was seen encircling the upper part of the gullet. Three years later, Willet[3] performed the operation on a woman, aged forty-seven, suffering from œsophageal carcinoma; the patient had begun to regain her strength when she refused to be fed, and died of exhaustion eighteen days after the establishment of the fistula. In 1868, Cheever,[4] in an interesting report of two cases of external œsophagotomy for foreign bodies, took occasion to make some remarks on the same proceeding when practised for stricture of the gullet, and two years later the whole subject was fully discussed by Terrier[5] in an elaborate and valuable monograph. In 1870 the operation was performed by Menzel[6] on a patient of Billroth's, a man, aged forty-four, suffering from cancerous stricture; death took place on the following day. Three years subsequently, Podrazki[7] performed œsophagostomy on a man, aged forty, who had suffered from well-marked syphilis; the patient died two days afterwards, and his disease, which, during life, had been supposed to be of venereal origin, was found to be purely carcinomatous. In 1875, Poinsot[8] operated on a woman, aged fifty-five, whose œsophagus was obstructed by malignant growths; the patient expired twenty hours after the operation. In 1876,[9] I recorded a case in which œsophagostomy had been performed by Evans, nine years previously, on a woman, aged forty-three. The disease was malignant, and the patient died of collapse fifty hours after the operation. In the same year a case was related by Horsey,[10] in which he operated on a boy, aged five, who had swallowed some caustic

[1] Deutsche Klinik, 1859.
[2] Ibid., 1865, p. 37.
[3] St. Barth. Hosp. Rep., 1868, vol. iv. p. 204.
[4] Two Cases of Œsophagotomy, Boston, 1868, p. 61.
[5] De l'Œsophagotomie Externe, Thèse de Paris, 1870.
[6] Wien. Med. Wochenschr., 1870, No. 56, p. 1350 *et seq.*
[7] Ibid., 1873, Nos. 33, 35, 36.
[8] Reported by Bidau, De l'Œsophagotomie, Bordeaux, 1881, p. 19.
[9] Med. Times and Gaz., 1876, vol. ii. p. 137.
[10] Amer. Journ. of the Med. Sciences, new series, vol. lxxii., 1876, p. 114.

fluid; the gullet was unintentionally opened above the stricture, which was found to be quite impervious. The wound was therefore closed, and the little patient died of shock within twenty-two hours. In 1877, Kappeler[1] related two cases of œsophageal cancer, in which he made an opening into the gullet through the neck. In each instance the operation had been undertaken with a view to actual removal of the disease by excision, and it was only when this was found impracticable, owing to its extent and situation, that, as a desperate measure, œsophagostomy was tried. The first patient, a man, aged forty-two, died five days after the operation; whilst the other, a man of sixty-five, survived only forty-four hours. In the same year, Bryk[2] published a case in which he had performed œsophagostomy in a case of cicatricial stricture; the patient was alive seven weeks after the operation, but the ultimate result is not stated. Nicoladoni[3] also recorded a case in which he had recourse to œsophagostomy. The patient was a girl, aged four, who was suffering from cicatricial stricture of two years' standing; the gullet was incised above the point of narrowing, when it was found that the tube was dilated at its upper part. The little patient died in six days. An instance is related by Zenker,[4] where the operation was done on a boy, aged three years and a half, for cicatricial stricture. Death occurred within twenty-four hours. Simon is referred to by Kœnig[5] as having opened the œsophagus in a case of cancer, but no detail is given beyond the fact that the patient survived only thirty-four hours. Hadlich[6] operated in 1880 on a man, aged sixty, who was unable to swallow from some cause, the nature of which was not clearly established. The patient died thirteen months after the operation, but an autopsy was not permitted. In the same year Studsgaard[7] performed œsophagostomy on a woman, fifty-two years of age, suffering from cancerous stricture; she improved considerably after the operation, and died five months later from the natural progress of the disease. The same surgeon[8] operated quite recently on a girl, aged nine, who had swallowed nitric acid. Death took place eight days afterwards, owing to "hemorrhage from the internal jugular vein caused by septic ulceration." In 1880, œsophagostomy was also performed by Holmer,[9] of Copenhagen, on a man, aged fifty-seven, for cancer of the right tonsil and pharynx; the patient lived two months. In 1881, Annandale[10] related three cases in

[1] Deutsche Zeitschr. f. Chir., 1877, vol. vii. p. 381 *et seq.*
[2] Wien. Med. Wochenschr., 1877, Nos. 41 and 45.
[3] Ibid., No. 25.
[4] Ziemssen's Cyclopædia, vol. viii. p. 28.
[5] Krankheiten des Pharynx und Œsophagus, Stuttgart, 1880, p. 122.
[6] Deutsche Zeitschr. f. Chir.
[7] Hospitals Tidende, 2 R. vii. No. 43, Copenhagen, Oct. 27, 1880.
[8] Private letter from Dr. Studsgaard to the Author, dated Dec. 31, 1882.
[9] Hospitals Tidende, Copenhagen, 1882, No. 1.
[10] Liverpool Med.-Chir. Journ., No. 1, July, 1881, p. 14 *et seq.*

which he had performed the operation for cancerous stricture. In the first, the patient, a woman aged forty-two, survived three months, and finally died of septicæmia; in another, the patient, also a woman aged fifty-three, died in ten days. Unfortunately, no details are given of the third case, which is the more to be regretted, as it was one of exceptional interest, a second stricture having been encountered when the gullet had been opened below the first, and gastrostomy having, therefore, been found necessary. The operation has lately been practised by Timothy Holmes.[1] The patient was a man, about fifty years of age, who suffered from malignant stricture of the œsophagus; he died about three days after the operation. Reeves[2] has also recently performed œsophagostomy on a man, aged sixty-three, who died on the eighth day. To these cases should be added one in which Butlin[3] states that he witnessed an attempt at œsophagostomy which had to be abandoned owing to the wide extent of the disease, and another reported by Maydl,[4] in which it was found impossible to open the gullet in a case of cicatricial contraction, owing to the extreme hardness of the walls.[5]

The mode of performing œsophagostomy is as follows: The patient should be placed on his back with his shoulders somewhat raised, and his head turned toward the right side. An anæsthetic having been given, the surgeon, standing behind the patient's head, should make an incision through the skin on the left side from just above the sterno-clavicular articulation to about the level of the hyoid bone. The platysma should then be cut through, and if a vein of any size, such as the external or anterior jugular, is met with, it should be divided between two ligatures and turned aside. The superficial fascia should next be slit up on a grooved director along the line of the original incision, and the anterior edge of the sterno-mastoid laid bare. The patient's head should then be slightly raised, so as to relax the tissues of the neck, and an assistant should draw aside the sterno-mastoid with a retractor. The omohyoid (which can be recognized by its direction inwards and upwards) is now brought into view, and should be divided as near to its hyoid insertion as possible. The carotid sheath is next to be held aside together with the sterno-mastoid, whilst the trachea is drawn inwards by a second assistant. The connective tissue being torn through with the handle of the knife, the left lobe of the thyroid body should be raised and pushed towards the middle line, when the trachea will be fully exposed, together with the

[1] Med. Times and Gaz., July 29, 1882, p. 117.

[2] Private letter from Mr. Reeves to the Author, dated July 20, 1882.

[3] Sarcoma and Carcinoma, London, 1882, p. 184.

[4] Wien. Med. Blätter, 1882, No. 17, p. 523.

[5] Professor Gross, in the most recent (1882) edition of his Surgery, refers (vol. ii. p. 495) to cases in which this operation has been practised by Packard and Cohen. As I am unable to find any published details of either of these cases, they are not included in the above summary.

œsophagus behind it. It may sometimes be difficult to identify the latter tube, and it may be necessary, therefore, to pursue the dissection down to the pre-vertebral muscles. A sound[1] should now, if possible, be passed from the mouth through or into the stricture. By this means the operator will be guided to the situation of the gullet, which should be opened by a vertical incision 2½ to 5 centimetres long, through its lateral wall. In cases of cancerous stricture the opening should be made as far below the seat of disease as possible, whilst in cicatricial stenosis the knife may be carried through the contracted tissues. When the tube has been opened, a silk ligature should be passed through each edge of the œsophageal wound, and again through the corresponding lip of the cutaneous incision, and the gullet should be gently drawn towards the surface and loosely attached to the outer wound. A curved tube measuring about three inches in length below, and one above the bend, with a suitable shield at its upper extremity, should be introduced into the œsophagus through the wound, and fixed in position by means of tapes round the neck. Sutures may be used to bring the edges of the skin-wound together above and below the feeding-tube, should this appear desirable.

The food should, of course, be liquid, and in order to prevent it from soaking into the tissues of the neck, when the patient is to be fed, it is better to pass a second long inner tube some way down the gullet, through the shorter tube which is constantly worn. The nutritive fluid may either be injected with a syringe, or poured in through a glass funnel.

Œsophagostomy should never be performed unless there be good reason to believe that it will be possible to introduce a tube into the gullet below the seat of stricture.

On analyzing the recorded cases of œsophagostomy, it will be found that out of a total number of twenty-six cases, in which the operation was performed, sixteen, *i. e.* 61.5 per cent., died within a fortnight, whilst deaths from shock occurred in seven or 26.9 per cent. Œsophagostomy has been done seventeen times for the relief of cancerous stricture, four times for cicatricial contraction, three times for dysphagia caused by compression of the gullet from without, and twice for stenosis of somewhat doubtful character.[2] The longest duration of life after the operation in any of these cases was sixteen months; the shortest, eighteen hours.

In the malignant cases the average duration of life after the operation was rather more than fifty-two days. If, however, Tarenget's case, in which the patient lived sixteen months, be omitted from consideration as

[1] A special instrument was devised for this purpose by Vacca Berlinghieri (Della Esofagotomia, Pisa, 1820), consisting of a curved hollow sound widely fenestrated at one side to allow of the protrusion of a stylet which pushes the wall of the gullet outwards. An ordinary flexible bougie tipped with a metallic knob will, however, be found to answer just as well.

[2] Richet's case is too lacking in detail to be taken into account.

too vaguely reported and of too ancient date to be quite trustworthy, the average term of survival in the remaining fifteen instances was twenty-four days. In seven cases of œsophagostomy for cancer in which sufficiently full details are given for an estimate to be made, the average duration of the symptoms before the operation was six months, the longest being eleven months, and the shortest three months.

In the four cases in which œsophagostomy was done for cicatricial contraction, the average duration of life after the operation was nearly seven weeks. In three of the four, however, the patients were children, and in them the average was little more than two days and a half. This high mortality of the operation in the case of children utterly negatives the views of those who maintain that œsophagostomy does not cause much shock, and it points to the desirability of postponing the operation where practicable to a more advanced period of life.

In the three instances of dysphagia from compression, the average period of survival was five months, whilst in the two cases of doubtful nature it was nearly two months.

Death from the immediate shock of the operation took place in four of the cases of malignant obstruction and in two of the cases of cicatricial contraction. The statistics of this operation do not show the steadily progressive improvement which is seen in the case of gastrostomy.

The great *advantages* that are claimed[1] for œsophagostomy are :—

1st. That it is attended with comparatively little systemic shock.

2dly. That it facilitates subsequent dilatation of the stricture ; in other words, it is so far curative that it may enable the patient's existence to be indefinitely prolonged.

The supposed absence of shock, however, is not borne out by the actual facts, seeing in five cases[2] death occurred within twenty-four hours after the operation, whilst in a sixth[3] the attempt to open the gullet had to be given up, owing to the collapsed condition of the patient. As regards the second alleged advantage, it does not appear that there is any case on record in which an œsophageal stricture has been successfully dilated through an opening in the neck.

The *disadvantages* of the operation are :—

1st. That owing to the depth from the surface at which the gullet is situated, and the fact that when diseased it is often fixed to the surrounding parts, the operation is a very difficult one. (To this should be added,

[1] Whilst Follin (Rétrécissements de l'Œsophage, pp. 125–6, Paris, 1853), Terrier (De l'Œsophagotomie Externe, p. 62 *et seq.*, Paris, 1870), Annandale (Liverpool Med.-Chir. Journ., No. 1, July, 1881, p. 13), Bidau (De l'Œsophagotomie, p. 38 *et seq.*, Bordeaux, 1881), and T. Holmes (Med. Times and Gaz., July 29, 1882, p. 118) give a moderate support to the operation, Mr. Reeves (Trans. Clin. Soc., vol. xv., 1882, p. 29 *et seq.*) has come forward as an uncompromising champion of it.

[2] Menzel, Poinsot, Kappeler, Horsey, Zenker.

[3] Maydl, loc. cit.

in cases of cicatricial stenosis, that the walls of the organ may be so tough as to make it difficult, or even impossible, to cut through them.)

2dly. That great *danger* inevitably attends a cutting operation carried out in immediate proximity to such important structures as the large bloodvessels and nerves of the neck, and the thyroid gland, which is not unfrequently enlarged in cases of œsophageal stenosis.

3dly. That there is great *uncertainty* in any given case whether the opening in the œsophagus can be made below the stricture. (Even when its upper limit can be made out with tolerable accuracy, the extent of the disease cannot even be guessed at, and if in an exceptionally favourable case the lower margin could be approximately ascertained, a second stricture may exist lower down.)

4thly. That a discharging fistula in the neck is a conspicuous disfigurement.

Comparing gastrostomy and œsophagostomy together, it may be affirmed —1st, that gastrostomy is both *easier* and *safer* to perform, the risk of hemorrhage and other surgical complications being much less; and, 2dly, that gastrostomy *always* meets the difficulty to be overcome—that is to say, the obstruction to the passage of food into the stomach—except in those comparatively rare cases in which the stomach itself is also diseased. The effect of either procedure in relieving the patient's immediate sufferings, notably from thirst, and occasionally, in a less degree, from hunger, is often very marked, and it might be expected that the disease would make less rapid progress when the gullet is no longer exposed to irritation by persistent endeavours to swallow. It cannot, however, be denied that the benefit of these operations has often been shown more in the euthanasia which they have brought about, than in any appreciable prolongation of the patient's life. In fact, judging from statistics alone, operative interference would seem to be attended with less satisfactory results than the milder palliative measures generally adopted. Thus, whilst the average duration of life in a series of 100 of my cases of malignant stricture of the gullet—in which no operation was attempted—was *eight* months, the average extent of life after the first manifestation of distinct symptoms till death in fifty-three cases in which gastrostomy was performed was *seven* months.[1] The records of œsophagostomy for cancer seem at first sight more favourable than either of the above estimates, for in eight

[1] It is right to state, however, that the recent records of this operation taken alone show much better results. Thus, in twenty cases reported since 1879, the average duration of life from the first onset of the disease was seven and a half months, notwithstanding that in one case the period of survival is only reckoned as four months, and in another as ten days, though the patients in each instance were still alive, and likely to live for some time, at the date of report. If the Albert-Maydl cases alone are considered, a still more favourable result will be found. The total average in seven cases was eleven and a half months, notwithstanding that one of the patients still living at the date of report is only counted as surviving the operation six weeks.

cases, of which sufficient details are given to form the basis of such a calculation, the average period from the first appearance of dysphagia till death was *ten* months. This result is, however, largely due to Podrazki's case being included; and it may be pointed out that the long duration of antecedent dysphagia in this instance furnishes no very certain measure of the length of time during which the *cancer* had existed, the patient having suffered severely from syphilis, and the difficulty of swallowing having at first yielded to anti-venereal remedies. Moreover, as the patient survived the operation only two days, it is obvious that the weight which the case apparently throws into the scale in favour of œsophagostomy is quite illusory. Podrazki's case may therefore be disregarded as being merely a disturbing element in the present calculation. The remaining seven cases of œsophagostomy for malignant disease show an average duration of life of only *seven* months after the first appearance of symptoms.

INTERNAL ŒSOPHAGOTOMY is an operation which, though it has *à priori* much to recommend it, is unfortunately very seldom applicable owing to the extent and character of œsophageal strictures.

History of the Operation.—To Maisonneuve[1] belongs the credit of first attempting to relieve cicatricial stricture of the gullet by internal incision. He operated on three cases, of which two died and one recovered. In the two fatal cases the patients were women, and succumbed to peritonitis. In a fourth case in which Maissonneuve attempted internal œsophagotomy the patient's death was due to a false passage which was made into the posterior mediastinum. Lannelongue[2] soon afterwards operated successfully. Dolbeau[3] performed the operation on two patients, both of whom appeared to be cured as long as they continued under observation. Trélat[4] had a good result from the procedure in spite of severe primary and secondary hemorrhage. Tillaux,[5] Studsgaard,[6] and Schilz[7] have each reported a successful case. The last-named surgeon was less fortunate in a second instance, in which the patient died from profuse hemorrhage.[8] Czerny[9] performed the operation on a child who died from periœsophageal cellulitis complicated by diphtheria. Recently cases have been treated after this method by myself and by Dr. Roe,[10] of Rochester, U. S., the particulars of which will be found below. Dr. Elsberg,[11] of New York, has also operated successfully in two cases.

[1] Clinique Chirurgicale, Paris, 1864, t. ii. p. 409.
[2] Mém. de la Soc. de Chir. de Paris, 1865, t. vi. p. 547.
[3] Gazette des Hôpitaux, 1870.
[4] Bull. Gén. de Thérap., 1870, t. lxxviii. p. 252.
[5] Bull. de Thérap., 1872, t. lxxxiv. p. 14.
[6] Canstatt's Jahresb., 1873, Bd. ii. p. 487; and 1875, Bd. ii. Abtheil ii. p. 297.
[7] Correspondenz-Blatt. d. Aertz. Verein. in Rheinland, April, 1877, No. 19, p. 19.
[8] Ibid. [9] Beiträge zur Operat. Chirurg., 1878, p. 70.
[10] New York Med. Record, Nov. 11, 1882.
[11] Arch. of Laryngol., Jan. 1883.

The stricture has sometimes been divided from above downwards,[1] but this method is extremely dangerous, and should never be attempted. The incisions should always be made from below upwards. Special instruments have been devised for the purpose by Dolbeau,[2] Trélat,[3] and myself. My œsophagotome consists of a gum-elastic bougie, about fifteen inches long, terminating in a small metal cap about one inch in length, and of slightly larger calibre than the rest of the instrument. Through the interior of the bougie runs a wire, the lower end of which is attached to a small cutting blade, whilst its upper extremity is connected with a spiral spring. By pressing a metallic button at the top of the bougie, the knife is thrust out through a slit on one side of the metal cap. A little notch in the edge of the button corresponding to the slit guides the operator as to the position of the cutting blade. The use of my instrument is perfectly simple. It is introduced into the gullet with the blade concealed, and when the part containing the knife is felt to be below the stricture, the blade is to be made to protrude, and by a rapid upward movement to cut through the obstructing band. The only place where this division can be safely practised is at the posterior wall of the gullet, and there only in the upper three-fourths of the tube. A week after the operation a medium-sized bougie should be passed and instruments of gradually increasing calibre should subsequently be used from time to time.

From an examination of the results of the published cases, internal œsophagotomy does not appear to be a very satisfactory operation. Of the seventeen cases in which it has been practised, four died, *i. e.*, 23.5 per cent. This estimate includes only cases which proved fatal within fifteen days of the operation; the mortality would doubtless appear much higher if all the cases were counted in which death, though directly traceable to the operation, did not occur within the above-mentioned period. Thus, in my own case the patient died three months after the œsophageal stricture was divided, but the pulmonary inflammation, to which he ultimately succumbed, came on so soon after the operation that it is most probable there was a casual relation between the two events.

On analyzing the statistics more closely it will be found that the operation has been done eleven times for the relief of cicatricial stricture, twice for œsophageal stenosis of an indefinite nature, once for malignant, and once for tubercular disease. Of the remaining two cases I have no details beyond the fact recorded by the operator that they were successful. Of the cicatricial cases three, *i. e.* 27.28 per cent., died. This average, however, would be considerably reduced if each individual act of œsophagotomy were to be counted as a separate case, for the operation was performed six

[1] By Maisonneuve, Lannelongue, and Studsgaard.
[2] Bull. de la Soc. de Chir. de Paris, Mar. 16, 1870.
[3] Bull. de Thérapeutique, 1870, t. lxxviii. p. 252.

times on one of the patients, three times on another, and twice on a third. This would raise the total number of operations to nineteen, with a mortality of only 15.7 per cent. In the case of malignant disease intra-œsophageal section was practised five times, on each occasion with definite, though transient, benefit, and the patient finally died of phthisis. The patient with tubercular stricture died of peritonitis four days after the operation.

The *advantages* of internal œsophagotomy are:—

1st. That it is attended with an inconsiderable amount of shock.

2dly. That if the stricture can be thoroughly divided, gradual dilatation can be carried out and a cure thereby be effected.

3dly. That the procedure involves no external wound requiring constant attention and giving rise to disfigurement.

The *disadvantages* of internal œsophagotomy are:—

1st. That it can only be safely performed in cases where it is still possible to get a bougie through the stricture.

2dly. That owing to the formation of these structures, which often extend far down the gullet, it is difficult to get beyond all the points of obstruction. (It may be added that in many cases of cicatricial narrowing the obstructing ridges are vertical in direction, as in the second case detailed below, and therefore cannot be divided by any instrument.)

3dly. That in many cases the walls of the œsophagus are so much thickened that limited longitudinal incision does not relieve the obstruction.

4thly. That the actual danger attending the performance of the operation is far from inconsiderable. Indeed the thinness of the œsophageal walls, the close proximity of many vital organs, and the fact that in disease the gullet is often intimately adherent to the surrounding parts, constitute dangers which cannot be ignored. In one of the fatal cases, death was due to hemorrhage, and in one of the successful operations bleeding occurred to an alarming extent.

In the first of the two following cases of cicatricial stricture, internal œsophagotomy was performed; in the second, it was intended to do the operation, but circumstances prevented its being carried out. The important features in the case were that many of the obstructing ridges were *vertical* in direction, and could not have been divided by any œsophagotome; and further, the great extent of the disease which would have made any operation, except gastrostomy, absolutely useless.

CASE 1. Henry A. drank a solution of potash on September 17, 1880, and in spite of immediate treatment at the London Hospital, his gullet became so much narrowed that thirteen weeks elapsed before he was able to swallow fish. The stricture was treated by gradual dilatation until February, 1881, when, owing to an attack of smallpox, the patient discontinued his attendance for four weeks. When seen again he could swallow nothing but jelly. He was admitted into the Hospital for Dis-

cases of the Throat, under my care, on April 7, 1881, being by that time in an extremely weak condition. The stricture was found to begin just below the level of the cricoid cartilage, the canal of the œsophagus at the affected part being very tortuous and deviating to the left side. Gradual dilatation rendered it possible to pass a No. 8 bougie by June 2, but more than a month later an advance of only one size had been made. On July 12, I performed internal œsophagotomy, dividing the stricture in the middle line behind from below upwards. A No. 14 bougie could then be passed without difficulty. The pain of the operation was slight, but in a few hours the patient began to feel some discomfort over the base of the right lung, and unmistakable signs of pneumonia soon afterwards showed themselves. Dilatation with bougies was resumed after a few days, and in August No. 15 could be passed easily. The patient was shown to the members of the International Congress on August 4, and at that time, whilst still suffering from some pulmonary trouble, his general condition was fairly satisfactory. He passed from my care a day or two afterwards, as the Throat Hospital had to be closed for the purpose of being rebuilt. He soon afterwards re-entered the London Hospital, and died in that institution about the middle of October, 1881. At the autopsy both lungs showed patches of pneumonia, and there was some purulent effusion in the right pleura. The gullet was found thickened to such an extent as to narrow considerably the calibre of the tube for three inches downwards from the level of the cricoid cartilage. The strictured portion was found to have been divided posteriorly for about an inch at the lower part.

CASE 2. Sarah C., aged twenty-six, swallowed hydrochloric acid on February 16, 1879. She was taken to Guy's Hospital, where the immediate symptoms were treated, but the dysphagia increased so much that on April 24 gastrostomy was performed by Mr. Howse. The patient was fed entirely through the artificial opening for nearly a year, when dilatation with bougies, which had been found impracticable at an earlier period, owing to the tightness of the stricture, was again attempted. By this means the patient recovered the power of swallowing to such a degree that Mr. Howse allowed the fistulous opening to close, warning the patient at the same time that it would be necessary to pass a bougie occasionally. She left Guy's Hospital in August, 1880, in consequence of some disagreement with the nursing authorities. On September 6, in the same year, she came under my care at the Throat Hospital. A No. 2 bougie was passed, and the stricture was gradually dilated till it was large enough to admit a No. 9, and the patient's condition improved considerably. In February, 1881, however, the dysphagia had again become so severe that she had to be taken into the Throat Hospital, where for three months she was confined to bed, suffering from constant pain between the shoulders, which was increased when she tried to swallow. During all this time her temperature was always above the normal point, being often as high as 102° Fahr. in the evening. No cause, however, could be discovered for the pyrexia. After this illness the patient steadily improved for some time, in spite of occasional relapses. In the autumn of 1882 her gullet again became almost blocked up, in spite of constant attempts at dilatation, and she gradually lost strength till the early part of November, when she died.

On *post-mortem* examination the body showed little sign of wasting, there being fully an inch of fat on the abdominal walls. Both lungs were adherent to the chest walls. The œsophagus was bound to the pre-verte-

bral muscles by bands of dense fibrous tissue, rendering its separation from the surrounding parts very difficult. Barely half an inch below the cricoid cartilage the stricture commenced, and extended downwards to within two centimetres and a half of the cardia. The walls of the gullet throughout the whole of the strictured portion were enormously thickened, the cut edge in some places being an eighth of an inch in width, and very tough. The narrowest part of the stricture corresponded to the upper inch and a half of the gullet, and consisted of four longitudinal ridges, mainly situated on the anterior wall, but partly on the sides of the gullet. These ridges almost completely blocked up the lumen of the œsophagus, which was still further narrowed at their lower end by a transverse cicatricial band connecting them together. Lower down the stricture was made up of a meshwork of bands, most of which had a transverse direction. Throughout the strictured portion of the gullet its walls were hard and thickened. Seven centimetres above the cardia there were three openings, admitting a large probe, surrounded by some cicatricial bands. These openings communicated with a canal, which ran for two centimetres and a half downwards, and slightly to the right between the muscular fibres, and terminated in a pouch covered with muscular fibres, half an inch long, external to the gullet. Higher up, at a point rather below the middle of the œsophagus, there was a minute perforation, leading into the trachea through its posterior wall. The stomach was $6\frac{1}{4}$ inches in its smaller curvature and $12\frac{1}{2}$ in its larger curvature. Its anterior surface measured $3\frac{1}{2}$ inches in its widest part, and 2 inches in its narrowest part.

There was a cicatrix $2\frac{1}{2}$ inches long in the abdominal wall, and on opening the stomach a depressed cicatrix, with radiating ridges, was seen about an inch and a half from the greater curvature and rather nearer the pylorus than the cardia. The stomach was united to the anterior wall of the abdomen by a dense fibrous tissue.

Dr. Roe, of Rochester, U. S., has lately reported two cases[1] in which he has successfully used my œsophagotome. One was that of a lady, aged twenty-four, on whom he twice operated for stricture of the gullet, making on the first occasion one posterior incision, and on the second two lateral cuts, after which dilatation with bougies could be satisfactorily carried out.

The patient in the other case was a boy, aged eight years, whose œsophagus was narrowed at its lower part through the action of a caustic fluid, to such a degree that even milk could scarcely be swallowed. Dr. Roe divided the stricture in six different places at intervals of a few days, and then practised dilatation with success.

On reviewing the whole subject, it appears to me that the conclusion plainly pointed to by the facts set forth in this article is that the three operations stand, as regards relative merit, in the order in which they have been described. Gastrostomy may now be said to have taken its place among the procedures of every-day surgery, and a hope may legitimately be entertained, that, as the increasing resources of science render earlier detection of œsophageal disease possible, the results of the opera-

[1] New York Med. Record, Nov. 11, 1882, pp. 536 and 538.

tion will be still more satisfactory in the future. The fatality of gastrostomy has, no doubt, been in great measure due to the fact that it has often been performed only at the eleventh hour, when the patient was almost moribund; "a species of refined cruelty reflecting no credit on surgery," to use the words of an authority venerated on both sides of the Atlantic.[1] Œsophagostomy has necessarily a much narrower range of usefulness; it is always more or less a "leap in the dark," and its effects may occasionally be brilliant; it is, after all, an operation more likely to find favour with the adventurous surgeon than with the careful practitioner. In cases of syphilitic origin, however, when the stricture is at the upper part of the gullet, œsophagostomy offers a very good prospect of success, as the disease is much more frequently *limited* in its extent than either cancer or the lesions produced by corrosive fluids. As regards internal œsophagotomy, increased experience will probably show, that, though its immediate results are not so frequently fatal, its ultimate effects, when successful, are less beneficial to the patient than those of either gastrostomy or œsophagostomy.

ARTICLE X.

RHABDOMYOMA OF THE PAROTID GLAND. By T. MITCHELL PRUDDEN, M.D., Director of the Physiological and Pathological Laboratory of the Alumni Association of the College of Physicians and Surgeons, New York; Lecturer on Normal Histology in Yale Medical College.

THE interest and importance which have always attended the study of the rare and complex tumours called Rhabdomyoma, or Myoma striocellulare, won greatly in significance when their characters and occurrence were adduced by Cohnheim in support of the very suggestive theory of the embryonal origin of tumours.

The fact that tumours, composed wholly or in part of such a highly organized type of tissue as striated muscle, should be formed in organs like the kidney, testicle, etc., where such tissue does not properly belong, was entirely inexplicable on any of the earlier hypotheses concerning the etiology of tumours. If, however, it be assumed that, at some time during the process of differentiation of tissues and formation of organs in the embryo, some cell or cluster of superfluous cells should form and then cease to develop, or become misplaced in such a way that its further development is rendered for the time impossible, and should remain quiescent but still endowed with all the potentialities of embryonal cells, until at

[1] Gross, System of Surgery, 6th ed., 1882, vol. ii. p. 495.

some period of later life when the conditions favourable to its development might occur, the formation of such heterologous tumours would be no longer enigmatical, and their life history would be in conformity to the general laws of tissue growth and development.

While the adoption of this hypothesis rendered comprehensible the occurrence of a large majority of the heterologous tumours, it found in the rhabdomyomata a most striking illustration, from the fact that they occurred—and occurred apparently exclusively—in connection with the genito-urinary system—that is, in a series of organs whose development involves such unusually complex changes during their evolution as might well favour the occurrence of such slight irregularities in growth and malpositions of minute clusters of cells as this hypothesis postulates.

It is the purpose of this paper to record a new case of an heterologous rhabdomyoma, which presents some unique and significant features both in structure and position.

The writer is indebted for the epitomized clinical history of the case to Dr. E. T. Weed, House Surgeon to the Roosevelt Hospital, N. Y.

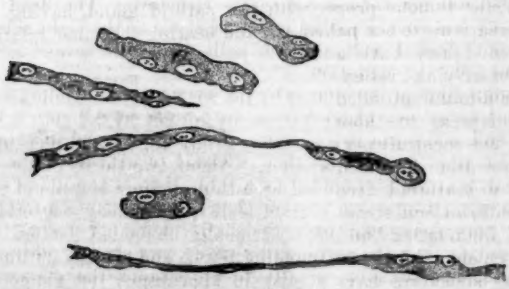
C. B., a healthy lad, seven years of age, observed a swelling on the right side of the face, which was found to depend upon the existence of a small tumour situated near the angle of the jaw. It gradually increased in size, being painful, especially at night, and at last the swelling opened, discharging several pieces of bone. Healing then occurred, and the part remained in a quiescent condition for some time. Patient was admitted to hospital about twelve months after the first appearance of the tumour, with considerable swelling of the right lower half of face. During the operation at the seat of lesion, dead bone was discovered on the outer surface of the ramus of the jaw. A moderately firm ovoidal tumour, about the size of a pigeon's egg, was found occupying the position of the parotid gland, which was not seen as a separate structure. The dead bone and tumour being removed, a partial facial paralysis of the right side resulted, but the wound healed well, and the patient was discharged cured about eight weeks after the operation.

The examination of the tumour by the writer gave the following results: The tumour, measuring about 5.7 cm. by 3.8 cm. by 3.2 cm., is in general lobulated, and consists of two portions, firmly united, and merging without sharp demarcation into one another. About two-thirds of the tumour is quite firm in texture, surrounded by a thin, distinct capsule of connective tissue, and upon transverse section shows, irregularly scattered through the mass, tiny spheroidal or occasionally elongated bodies, somewhat lighter in colour than the surrounding tissue, and sharply outlined against it. These bodies resemble greatly in appearance the glomeruli of the spleen. The remaining third of the tumour is distinctly lobulated, soft, and has the general appearance of the parotid gland. The above-described spheroidal bodies are most abundant near the zone of junction of the harder and softer portions of the tumour, but they are present throughout the mass, and in general each thin section of one cm. square shows from eight to twelve of them.

Upon microscopical examination, the smaller, softer portion of the

tumour presents the structure of normal parotid gland. The remainder of the tumour consists largely of connective tissue, for the most part dense, but in some places loose in texture. Embedded in this, and quite uniformly distributed, are fascicles or lobular masses, consisting of striated muscle fibres in various stages of development, and surrounded by loose connective tissue. These lobules of muscle tissue are abundantly supplied with bloodvessels, and many of them contain numerous small spheroidal cells similar in appearance to leucocytes. These lobules of muscle tissue make up about one-fourth of the entire bulk of the tumour. The most fully developed of the muscle fibres vary greatly in diameter, ranging between 0.035 and 0.005 mm. They are entirely without a sarcolemma, elongated nuclei being irregularly and scantily distributed along their sides, and they are grouped in an exceedingly irregular manner, twisting and curling and crossing one another. Both transverse and longitudinal striations are clearly defined, but Krause's and Hensen's lines are only occasionally faintly visible. Thickly scattered among these more fully developed muscle fibres, in most of the lobules, are numerous large, finely granular, spheroidal, ovoidal, and broadly fusiform cells, ranging in the shortest diameter from 0.01 to 0.02 mm., and having small, mostly peripherally placed, nuclei. These cells are in many cases closely clustered along the walls of the bloodvessels, from the proliferation of whose peripheral cells they appear to originate. The bodies of these cells are deeply stained by eosin, assuming the same tint as the more fully developed muscle fibres. Between these ovoidal or elongated simply granular cells with peripheral nuclei and the incompletely developed but distinctly striated muscle fibres, all intermediate forms are found in close contiguity. The elongated cells appear at first to lie in rows, and then to form a nodulated longer or shorter cord, upon which, here and there, in many cases, the first faint indications of transverse striations may be seen. Fig. 1 shows some of these intermediate forms.

Fig. 1.

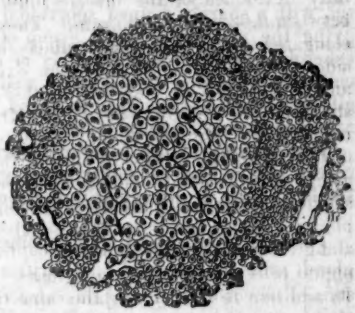


The small whitish bodies, above mentioned, vary in diameter from 0.2 to 1.0 mm. They are situated sometimes within the lobules of muscle fibres, and sometimes in the connective tissue between the latter. They appear to be invariably associated with small arteries, surrounding them or lying close at one side. In some sections which were suitably cut, a branching artery could be seen, upon whose larger and smaller divisions

these bodies were grouped in a manner similar to the arrangement of the glomeruli in the spleen, but much closer together. The structure of these bodies differs. The smaller ones consist simply of a collection of small spheroidal or polyhedral cells, closely packed together, without demonstrable intercellular substance, and closely surrounding a small artery, the whole being sharply outlined against the surrounding tissue. Such a structure is represented in Fig. 2. Then there are somewhat larger bodies

Fig. 2.

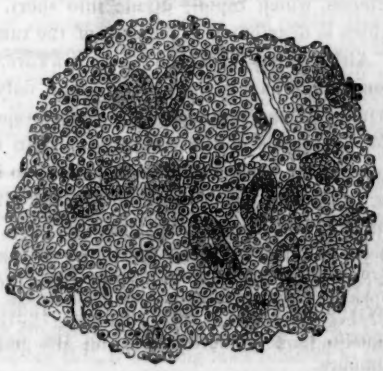
Fig. 3.



which have the same general appearance, but which have a well-marked underlying reticulum of fine anastomosing fibres. The meshes of this reticulum are filled with cells: those near the periphery being small, spheroidal, or slightly polyhedral, resembling leucocytes, and very closely packed together; while the central meshes are occupied by larger polyhedral cells with large nuclei. These structures are usually well supplied with capillary bloodvessels, Fig. 3.

Then still another variety of these bodies is seen, especially near the junction of the tumour proper with the parotid gland, having the same general appearance to the naked eye and bearing the same relation to the bloodvessels. They have a delicate underlying reticulum, whose meshes are filled with cells similar to those occupying the central portions of the last described bodies. But scattered here and there within them, sometimes few in number and again very abundant, are seen tubular structures having a thin membrana propria and lined with cylindrical or cuboidal or polyhedral cells. Those lined with cylindrical and cuboidal cells have usually a well-defined lumen, while those lined with poly-

Fig. 4.



hedral cells usually have none. The peripheral zone of small cells is usually absent in the bodies showing these rudimentary ducts (Fig. 4).

Approaching the zone which lies between the parotid and the hard part of the tumour, the spheroidal bodies are seen to contain more and more well-defined glandular structure, excretory ducts, and normal alveoli. Often on one side of the body the structure exactly resembles that of a well-formed small lobulus of the parotid gland, while the other is occupied entirely by a mass of spheroidal cells. On the other hand, in this border-zone isolated bodies are seen resembling a well-formed lobulus of the parotid, with a sharply defined spheroidal mass of indifferentiated cells occupying the place of a small group of alveoli. Thus, between the small spheroidal bodies formed simply of a circumscribed collection of small cells around a bloodvessel, and a well-formed lobule of the parotid gland, all intermediate forms may be found, some of the more typical of which are described and figured above.

The arteries in the tumour present in a most typical form, in many cases, the lesions of obliterating endarteritis. Numerous larger and smaller nerves are irregularly distributed through the tumour.

The tumour, then, intimately connected with and involving the parotid gland, presents the usual peculiarities of structure of the rhabdomyomata. In addition to this, it contains structures which the writer feels justified in considering as atypical rudimentary lobules of the parotid gland—atypical not only in structure and development, but in their distribution through and association with the incompletely developed muscular tissue.

It will be seen, also, from the above description, that while the whole tumour is lobulated, the lobules differ in a striking way in different parts: in one part are the lobules of the normal parotid; in another the lobules are composed in part of gland-structure and in part of the above-described peculiar nodular masses of cells; in still a third portion these cell-masses occupy a part of the lobules of muscle tissue; and lastly there are lobules containing only muscular and connective tissue. The distribution of the arteries is similar throughout; small trunks are given off from the main arteries, which rapidly divide into short, thick branches, each system of which is distributed to portions of the tumour forming the lobules.

Although, as far as the writer is aware, the genuine heterologous rhabdomyomata have hitherto been found only in connection with the genito-urinary organs, and have thus seemed especially significant in the light of the hypothesis of the embryonal origin of tumours, yet the situation of this tumour is none the less calculated to lend weight to this hypothesis; for in the first place, like most of those hitherto described, it is a complex tumour; and secondly, its situation near the seat of the embryonal gill-clefts would suggest the possibility of the occurrence of irregularities in development not less important than those associated with the organs derived from the Wolffian bodies. Indeed, the parotid gland, as is well known, is a favourite field for the development of complex forms of tumours.

Without purposing to give a complete bibliography, it seems appropriate to append a list of the publications which are most closely connected with the theme of the present paper.

BIBLIOGRAPHY.—*Cohnheim*, Virchow's Archiv, Bd. 65, p. 64. *Marchand*, Virch. Arch., Bd. 73, p. 289. *Eberth*, Virch. Arch., Bd. 55, p. 518. *Landsberger*, Berlin. klin. Wochenschr., 1877, No. 34, p. 497. *Kocher and Langhans*, Deutsch Arch. f. klin. Chir., Bd. 9, p. 312. *Huber and Boström*, Deutsch Arch. f. klin. Med., Bd. 23, p. 205. *Virchow*, Virch. Arch., Bd. 53, p. 441. *Billroth*, Virch. Arch., Bd. 8, p. 433; Bd. 18, p. 70. *Senftleben*, Virch. Arch., Bd. 15, p. 336. *Koleznikow*, Virch. Arch., Bd. 68, p. 554. *Rokitansky*, Zeitschr. d. Wiener Aertzte, Jahrg. 5, Heft. 5, 1849. *Heschl*, Virch. Arch., Bd. 8, p. 126.

ARTICLE XI.

LEPROSY IN THE HAWAIIAN ISLANDS. Extract from the Report of J. R. TRYON, A.M., M.D., Surgeon U. S. Navy.

THE interesting group in the North Pacific Ocean composing the Hawaiian Islands are Oahu, Hawaii, Maui, Molokai, Kauai, Niihau, Lanai, Kahoolawe (uninhabited), and four barren rocks, Molokini, Lehua, Kaula, and Nihoa, or Bird Island, and all situated in latitude 18° to 23° north, and in longitude 155° to 161° west. Although they lie within the tropics, the weather is always pleasant, never cold and never oppressively hot, the thermometer seldom reaching above 90° even in the hottest days of the warm months, and by ascending the mountain sides a cooler temperature can be enjoyed. The climate, in fact, throughout the year, is the most perfect, healthy, and agreeable that can be found anywhere in the world. During the ship's stay at Honolulu, the average temperature was 70°.

These islands being only 2100 miles from San Francisco, the principal seaport on the western coast of America, in weekly communication with said port, and yearly increase of commercial relations and public travel, I consider it a duty to call the attention of the government, through this report, to the existence and spread of leprosy in the islands, with the hope and suggestion that some steps may be taken by the proper health authorities to prevent the introduction of the disease into the United States.

The Hawaiian government saw the necessity some years ago of doing something to prevent the spread of leprosy, and in 1865 founded a leper settlement on the island of Molokai, where patients affected with the disease could be thoroughly isolated, and treated in hospitals provided for the purpose. This system has done much, no doubt, in preventing an increase of the disease, and some indications of progress in that direction would doubtless be observable before this, if existing laws relating to their absolute segregation had been thoroughly carried out. This, unfortunately,

however, has not been done, and a large proportion of lepers are allowed to remain undisturbed, with their families and friends, throughout the islands, to unconsciously disseminate the disease.

As there is a great and perfectly natural antipathy on the part of the natives to removal to Molokai, a branch hospital has been recently started at Honolulu, inviting those affected with the disease to apply voluntarily for treatment and care. This establishment contains now about 100 patients, and with the 800 confined to the leper settlement at Molokai, makes only 900 under government control; while, according to the last report of the board of health, the number of lepers in the kingdom is estimated at 2000, or 5 per cent. of the whole native race, and also stated that as many more have the seeds of the disease. It is therefore safe to state, that there is not only a larger proportion of recognized lepers in the Hawaiian Islands than in any other country in the world, but that the proportion, from statistics and observation, is steadily increasing.

I was pleased to learn, before leaving, that the board of health had determined to make a rigorous search in the districts of Honolulu to ascertain the exact number of persons suffering from the disease, their race, sex, age, condition, and other particulars, to settle the question as to the number at large in that particular section, and to subject them to proper treatment.

Leprosy, according to the popular belief of most natives, is supposed to have been introduced into the islands about forty years ago from China. The disease from that time has gradually spread from year to year, and has markedly increased since the indiscriminate and careless vaccination practised during the severe epidemic of smallpox in 1853, until it has finally assumed the proportions heretofore stated. It may be well to mention that, during the epidemic of smallpox referred to, there were 3546 recorded cases and 1276 deaths.

I can hardly credit the universal spread of the disease, but for the general belief that it is considered only slightly, or not at all contagious, and treated as such, from the beginning—allowing free individual intercourse—with weak enforcement of laws for its suppression.

The question of contagion forms, no doubt, a great factor in the study of the disease, and should be definitely settled before permitting the freedom now allowed. The whole history of leprosy in the islands points directly to its being contagious in nature, a disease certainly communicable to healthy persons, and propagated by the general mode of living to such natives coming in contact with it who are rendered susceptible to the poison through want of cleanliness, insufficient or poor diet of raw fish, seaweed, poi, etc., combined with a condition of system impoverished, perhaps, by syphilis, from which the native population have no doubt largely suffered.

It is an historical medical fact, that leprosy has spread in isolated villages,

from a single imported case, and reliable professional men, who have had opportunities of observing the disease, in countries where it exists, all declare in favour of contagion, viz: McNamara, of Bengal; Lob, of Hong Kong; Wolff, of Madeira; Millray, of Trinidad, and many others.

The Hawaiian Government should deal with the disease as a strictly contagious one, and adhere to such theory, in all legislation upon the subject, until the question has been reasonably settled, by those competent to investigate it thoroughly, by future research, and study.

Such study, and investigation, for the general benefit, if not preservation, of a race, should be commenced at once, and if a board, or scientific commission, of medical men, organized at any cost, and composed of experts, invited if necessary, from the United States and Europe, could be constituted by the Government for this purpose, there can be no doubt, great and good results would follow. The Government would certainly have the satisfaction of knowing that it had done all in the power of a civilized people to do, and upon the facts contained in the recommendations of such a commission, definite and wise legislation could be enacted to control the disease. Very little interest is taken in it by the general practitioners of medicine and others in Honolulu, owing no doubt to the fact that the Government offers no inducement to study it properly, and advise upon the subject.

At present, nothing certain is known regarding the cause of leprosy. It existed, no doubt, as a distinct disease in the middle ages—prevailed to a considerable extent in modern times in certain portions of Europe, and is still met with in warm climates of various parts of the world. With such facts, the theory recently advanced that it is identical with a certain stage of syphilis cannot be admitted, and any such belief can but be provocative of harm by misleading those who have the responsibility of action in the great question of relief, for a suffering people. Professional men, conversant with the medical history of the two diseases, and who have observed them clinically, cannot fail to recognize them as entirely distinct from each other.

The perfect teeth, thickened skin, palsy of face and limbs, *leonine* expression of countenance, loss of eyebrows and hair, except that of scalp, tubercles of the face, nose, ears, and extremities, varying in size from a pea to an olive, change of voice, ulceration of the surface, etc., insensibility of the general surface in patches, smooth and glistening condition of the skin immediately surrounding, dry ulceration, and falling off of fingers and toes, all appearing in cases of leprosy of different types, cannot be mistaken for syphilis. Nor can the lesions of bones of the tibia, skull, clavicle, ulna, and ribs, unsound teeth, alopecia, sore throat, iritis, gummy tumors, mucous and scaly patches, rupia and deep chronic ulcers, met with in cases of confirmed constitutional syphilis, be mistaken for leprosy.

My stay at Honolulu was too limited to study the disease satisfactorily, and I can therefore give only such observations regarding it as were de-

Fig. 1.

Face of a leprous patient, aged 30. Showing the peculiar "leonine" expression, and tubercular condition of the chin of the face. Under observation for three years.

Fig. 2.

Hand of above patient.

rived from individual cases coming under personal examination. These, in every instance, were similar to those seen some years ago in China and India, and no doubt the leprosy of ancient times. The special points in typical cases of course vary according to the stages of the disease. In the classification *tuberculosa*, spots generally appear first on the face, then on the legs, arms, and trunk, followed by an eruption and attack of fever, and often erysipelas. The attacks of leprous fever, and erysipelas, are quite common throughout the disease, but rarely fatal, the result being to diminish the redness and swelling of existing tubercles, and produce new growths, until finally patients present the appearances shown in the appended illustrations, strongly characterized by *leonine* expression and other peculiarities.

In the classification *anæsthesiaca*, there is a feeling of numbness, commencing generally in the under surface of the great toes, or ulnar side of hand and fingers, discoloured spots on arms, body, face, and lobes of ear, both analgesic and anæsthetic, palsied expression of countenance, and contraction of toes and fingers, shown in the accompanying figures. On

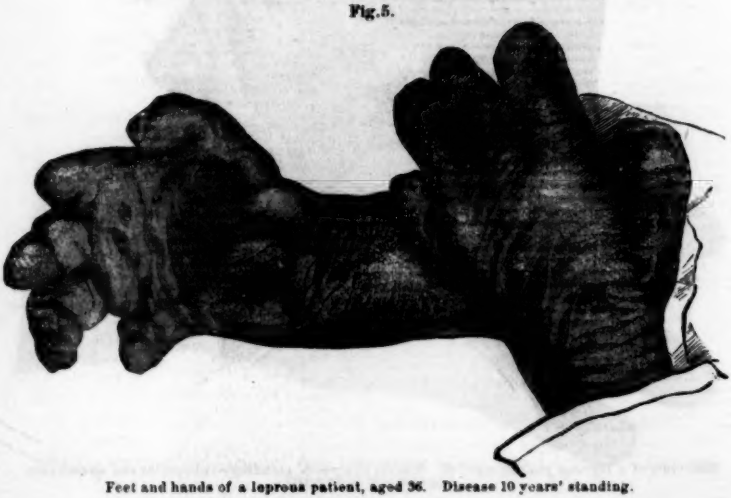
Fig. 3.

Side view of a leprous patient, aged 42. Disease five years' standing—tubercular and anæsthetic.

the spots in this form of the disease I have noticed papules, but rarely tubercules; nor is fever or erysipelas so frequent in such cases.

Fig. 4.

Fig. 5.



Feet and hands of a leprous patient, aged 36. Disease 10 years' standing.

I noticed in the large class of leprous patients visited a universal happy disposition, few complaints, and little realization, of their general hopeless condition. Many of them live on for years afflicted with a disease that is certainly incurable in advanced stages, and prospect of cure in any stage most uncertain.

Those under treatment in hospitals under government control receive a fair diet of poi, salt fish, meat, and vegetables, and as much professional attention and nursing as is possible, under the present ill-advised system. The iodide of potash and other remedies seem to be freely used, with imperfect results, and no record, if they have been tried, of the efficiency of hoang-nan and calcium sulphide. This whole subject certainly deserves not only the attention of medical men, but of governments and legislators, and no civilization can expect to prosper which allows its afflicted people to suffer and remain in the condition they now are. Without some speedy radical change, on the part of the government, by special and wise legislation, regardless of cost, directed to the proper investigation and possible extermination of this disease, and to ameliorate the condition of the people, one can but predict for the Hawaiian race, with the present number of naturalized foreigners and yearly increased immigration of Portuguese, Chinese, Norwegians, and Italians, a total extinction of the native population throughout the islands.

The decrease of the native population from 1872 to 1878 was 4023; increase of foreign population for the same period was 5111.

The population of the group was by the census of—

1832	130,313
1836	108,579
1850	84,165
1860	69,700
1866	62,959
1872	56,897
1878	57,985
Total population, December 28, 1878	57,985
" " " " 1872	56,897
Total increase since 1872	1,088
Total number of natives and half-castes in 1872	51,531
" " " " " in 1878	47,508
Decrease since 1872	4,023
Total number of foreigners in 1878	10,477
" " " " 1872	5,366
Increase since 1872	5,111
Total increase of foreigners since 1872	5,111
" decrease of natives since 1872	4,023
Total increase of population since 1872	1,088

Total number of Chinese in 1878	5,913
" " " " 1872	1,938
Increase of Chinese since 1872	3,978
Total number of half-castes in 1878	3,420
" " " " 1872	2,487
Increase of half-castes since 1878	933

The percentage of decrease of the *whole* population has been as follows:—

1850 to 1853, 3 years	13.10
1853 to 1860, 7 "	4.70
1860 to 1866, 6 "	9.67
1866 to 1872, 6 "	9.62

The percentage of increase from 1872 to 1878 is 1.91.

The percentage of decrease of the *native* population, including half-castes, has been as follows:—

1860 to 1866, 6 years	12.27
1866 to 1872, 6 "	12.31
1872 to 1878, 6 "	7.80

The percentage of children under 6 years of age to the whole population was:—

In 1872	12.08	In 1878	13.13

Total number of children under 6 years of age in 1878	7,608
" " " " " " " 1872	6,869
Excess in favour of 1878	739

The percentage of children under 15 years of age to the number of females was:—

In 1866 . 58.39	In 1872 . 62.59	In 1878 . 68.11

The percentage of children under 6 years of age to the number of females was:—

In 1872	27.21	In 1878	31.86

Of the 2581 inhabitants reported for the island of Molokai, 806 were lepers of the leper settlement of Kalawao.

ARTICLE XII.

TYPHO-MALARIAL OR CONTINUED MALARIAL FEVER.

By R. D. WEBB, M.D., of Livingston, Alabama.

FOR several years past, a continued fever has prevailed in this county (Sumter) and other parts of Alabama, variously designated as neglected

remittent, continued malarial, typho-malarial, and typhoid fever. This variety of names shows the unsettled condition of the medical mind in regard to its nature. It is doubtless the same fever brought into prominence during the late war, by Dr. J. J. Woodward, under the title of typho-malarial.

He says, in his paper read before the International Medical Congress, Philadelphia, 1876:—

"I never meant by this term to represent a specific type of fever, but intended to designate all the many-faced brood of hybrid forms resulting from the combined influence of the causes of malarial fevers and of enteric fevers."

Dr. Jerome Cochran (*Transactions of Med. Ass. State of Alabama*, 1875), while denying the existence of a true hybrid, says:—

"If fevers cannot change their types for the accommodation of careless diagnosticians, it may still be contended that two distinct fevers, as typhoid and malarial, may afflict the same human organism at the same time, both running through their usual stages side by side, and presenting a double set of lesions. Admitting, however, that two specific fevers may at the same time infest the same body, this view affords no aid to the advocates of the typho-malarial doctrine."

Dr. R. B. Maury (*Amer. Jour. Med. Sci.*, Apr. 1881):—

"The existence of a hybrid between typhoid and malarial fevers has been conclusively settled by Dr. Woodward's researches. But although such forms of disease exist, it should be remembered that, in civil practice at least, they are very rare. These cases I have always designated as *malarial continued*."

Dr. Johnson, Washington, D. C. "Mild Forms of Continued Fever" (*Amer. Jour. Med. Sci.*, Oct. 1882), says:—

"The facts properly classified and studied in their mutual relations lead inevitably to the conclusion that there is no justice, but positive error, in affixing the term '*malarial*' to all negative and doubtful cases of continued fever, as is the habit in diagnosis wherever the malarial and typhoid diseases appear side by side. The escape from the dilemma of uncertainty by offering a *hybrid name* to the doubtful cases is illogical. The conception of typho-malarial fever has come to be a device for easing one's self of the responsibility of accuracy in diagnosis."

Without further multiplying individual opinions, these extracts may be taken as representing the contrariety of medical opinion upon this subject. The following, based upon thirty years' observation of malarial fever at this point, is offered as a contribution to this subject.

The fact, that changes in the phenomena or type of diseases occur, is admitted by all. Malarial fevers are not an exception to this rule. Within the past half century they have undergone such striking changes as to almost conceal their lineage. These changes are observable both in regard to their *habitat* and type.

A prominent physician who had practised at Hillsboro, North Carolina, for fifty years, told the writer in 1851, that he had never seen a case of intermittent or remittent fever in that town or neighbourhood. Since that time they are common diseases of that place and State.

The following is an extract from a paper read before the American

Public Health Association, Savannah, 1881, "Malaria in New England," by Dr. J. F. Adams:—

"To the present generation of New Englanders, malarial fevers of home origin have been, until quite recently, wholly unknown. When that portion of the country was first settled *fever* and *ague* was one of the common diseases. Writers of that day make no mention of it subsequent to the latter part of the seventeenth century, and from this time onwards for a hundred years, namely; until the latter part of the eighteenth century, New England enjoyed complete immunity from the disease. From 1793, however, intermittent and remittent fevers prevailed in the western portion of Connecticut and Massachusetts until 1799. It then disappeared, and did not reappear until 1828, when it prevailed until 1836. From 1836 to 1850 no cases occurred. The latter part of 1850 it commenced another invasion, and at the present time prevails in Massachusetts, Connecticut, and Rhode Island."

In addition to this it may be stated that the Jersey shore, which was for a long while free from malarial fever, is now one of its favourite habitats. Such examples might be indefinitely multiplied, but this will suffice.

But it not only changes its locality at certain periods, but its phenomena—its type—undergo decided changes in the same locality at different periods.

In 1873 I made a report to the State Medical Association of Alabama, in which reference is made to this tendency to change in diseases, as illustrated in the malarial fever of this section. The following is an epitomized extract from that paper.[1]

Soon after the settlement of Sumter County in 1832–3, intermittent and remittent fevers made their appearance, and from 1835 to 1842 the county was noted for the variety and severity of its malarial fevers. The cold stage, or as it was frequently called, the *ague*, was the prominent feature of the disease. The initiatory stage was ushered in by gaping, stretching, and severe shaking, which made the teeth chatter; the pains in the back and limbs were severe. The chill would often last for an hour or more, and in some instances, the shock to the nervous system was so severe, as to produce a state of depression from which it was necessary to procure reaction by stimulants and external heat. The chill was followed by a fever of short duration and high grade, which went off with profuse perspiration. In from six to eight hours the patient was up, following his usual avocation. These milder intermittents were in the fall of 1835, accompanied by occasional remittents; but it was not until the summer and fall of 1836, that the remittents had become the prominent variety.

"These differed from the remittents of the present day (1847) in the greater distinctness of the cold stage, the higher grade of the fever, and the prominence of gastric and hepatic symptoms. They were ushered in with a sensation of coldness—slight in degree, but often long continued—with restlessness, thirst, vomiting, which were passed into a condition of intense heat and dryness of the skin; excruciating pain in the head and back; white, furred tongue; frequent, tense pulse; restlessness and irritability of temper. After eighteen or twenty hours a moderate perspiration and a less tense pulse ensue.

[1] I am indebted to "The Medical History of Alabama, by Dr. P. H. Lewis," for many of the facts here stated, prior to 1847.

"This remission was soon followed by a renewal of the above symptoms, and unless arrested by appropriate treatment, the patient passed into a state of delirium and fatal collapse.

"With the hepatico-gastric variety of open grade of remittent fever was mingled the *algid* variety of congestive fever. The patient complains of being languid and oppressed; he is restless; his skin is cool, damp, and clammy; his breathing is interrupted and sighing. In a few hours the extremities, as felt by another, become cold, soon extending up the body. The pulse is small and frequent, becoming finer and finer until it is imperceptible. The whole surface is bathed in a cold sweat; the skin is shrivelled, and the surface to the hand is cold and clammy; while the patient complains of being hot, and wants the cold, fresh air to blow upon him."

These were the typical malarial fevers from 1836 to 1842. From this time the malarial fevers began to assume a less open and active grade, and by 1845 they gradually approached a typhoid form. The cold stage was now less marked, being in many cases scarcely perceptible, the fever was less active, and the remissions less marked and of shorter duration.

At this time (1845) well-defined typhoid fever was imported from Virginia, by a company of negroes, into the county, and prevailed until 1855. This was an epidemic of true enteric fever, as indicated by its characteristic symptoms, and proven by ulcerations of Peyer's glands in numerous post-mortems.

Thus Dr. L. H. Anderson (at that time practising in Sumter County), in 1851 (*Trans. of Med. Assoc. State of Alabama*, p. 97), says:—

"The symptoms of the disease here do not differ materially from those laid down in the books, and the anatomical lesions are the same as are obtained elsewhere."

Dr. W. P. Reese, of Selma (1851), says:—

"Among the early symptoms we have dry, harsh skin, rather above normal temperature; tongue slightly coated, white, generally contracted, with point and edges more or less red. Later in the attack coma, subsultus tendinum, delirium, sleeplessness, meteorism, diarrhœa, enteric hemorrhage, and the tongue becomes very much contracted, dry, most frequently deep red on point and edges, and dark in centre; sordes and scaling of the epithelial coat of the lips."

Again, Dr. Anderson, in 1853, in enumerating the symptoms, says:—

"Diarrhœa existed in all fatal cases, and in most severe ones. The rose-coloured spots were found in nearly all the whites. Hemorrhage from the nose occurred in three-fourths of the cases; internal hemorrhage in about one-eighth; the tongue in all bad cases red and dry; in some brown and cracked. If furred at first, it generally became clean in a week or ten days; tympanites and gurgling were observed in about two-thirds of the cases."

Appended to these characteristic symptoms are the post-mortem appearances of three cases. I give the lesion in ileum of two of them.

"1. Ileum intensely injected on its outer surface; numerous ulcerations of Peyer's patches and the solitary glands, some almost perforating the intestines; more abundant near the valve.

"2. The lower part of the ileum and upper part of colon are one mass of ulceration, nearly black, and have a gangrenous odour. Higher up the ileum and lower in the colon the ulcerations were not so aggravated."

This epidemic of typhoid fever began to disappear in 1855–6, and was followed by a period of health from 1860 to 1866, during which time we had only mild intermittents and remittents. For the ten years, from 1856 to 1866, I do not remember to have seen a case of typhoid fever, and only a few malarial fevers, which continued so long as ten or fifteen days, assuming a semi-continued form in the last week of the attack.

In 1866 another wave of malarial fever set in, and in 1867 the fearful variety, known as *hemorrhagic malarial fever*, made its appearance, and prevailed until 1872. Since then it has been rare, only an occasional case being seen. On the decline of this hemorrhagic variety, the malarial fevers assumed a remittent type, with low grade of fever, and very slight remissions, until they have gradually attained the characteristics of what are now known as *typho-malarial* or *continued malarial fevers;* by others as typhoid fever.

These historical facts point to a change—a process of evolution—in the cause of these fevers, with a corresponding change in the phenomena of the resultant disease; yet it retains its malarial characteristics, and, though it resembles typhoid fever, is capable, by a proper differentiation, of being separated from it.

If the opinion that malarial fevers are of a fungous origin be true, this change of characteristics in the poison—the contagium vivum—is altogether consistent with the operations of nature in the vegetable world. Those who have read Darwin's origin of species will remember numerous instances of the appearance of new varieties of plants under varying circumstances of drainage and culture; and these influences are specially felt by the lower orders of plants, such as the algæ and fungi. Why then may we not have new varieties of malarial poisons, developed under varying environments? And if a change of poisons, why not an alteration in the characteristics of the resultant disease? The idea is not only consistent, but sustained by the admitted changes in malarial fevers in this country, referred to above.

Following the decline and disappearance of the hemorrhagic malarial fever of 1867 to 1872, the fevers of this county again took on a lower grade. Semi-continued fevers became gradually more common, until for the past three or four years continued malarial or the so-called typho-malarial fever is the prevalent disease.

As illustrative of these changes, and the character of the disease, I will give notes and charts of several cases, taken from my note-book. I would first direct attention to the hebdomadal feature of malarial fevers, a feature to which I will again refer in speaking of the differential diagnosis of malarial and typhoid fevers. I believe we often meet with cases of malarial fever which it will be difficult to control until the expiration of the seventh or eighth day (the hebdomadal period), even though we may use quinine freely up to this time.

Acting upon this view I am often indebted for success in such cases to the persistent use of quinine until this period, whereas, had I desisted sooner, my patient would have been doomed to a two or three weeks' spell of continued malarial or the so-called typho-malarial fever.

CASE I. Monday, Aug. 23, 1875, I visited A K—, a girl of 12 years of age, and received the following history of her case:—

On Saturday P. M., Aug. 21, she had symptoms of chilliness followed by fever. She got that evening a dose of calomel which acted well. The fever continued through Saturday night, with slight remission on Sunday (22d) morning, and also through Sunday and Sunday night, and now on Monday (23d) at 12 M. she has fever of a moderate grade. The parents were uncertain as to whether or not there had been remissions of fever on Sunday and Monday mornings; and were "waiting for the fever to go down sufficiently to give quinine."

Her fever (12 o'clock Monday) is not high, temperature 102°; pulse 110, and not full; tongue slightly furred and moist.

I directed 12 grains of quinine at three doses, to commence at 4 A. M. next morning. Intervals of two hours.

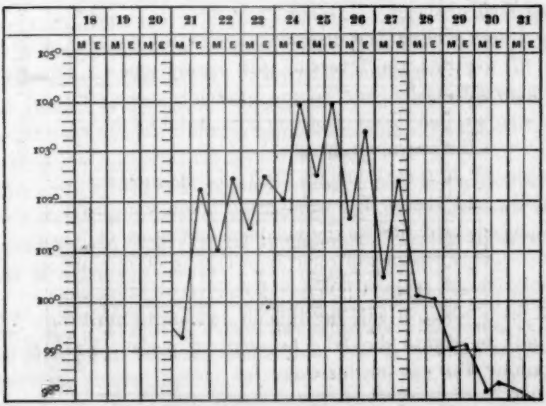
24th, A. M. Much the same; temp. 102°; disposed to diarrhœa; slight tympanites; no tenderness of iliac region; urine high-coloured. ℞. Tr. opii camph. and plumbi acet., to keep bowels in check. Spts. terebinth. rubbed over abdomen.

P. M. Temp. 104°; other symptoms same. ℞. Quin. sulph. gr. v, every two hours, until she takes 15 grains. To be commenced at 2 A. M. to-morrow.

25th, A. M. Temp. 102.5°; pulse 115; tongue moist, broad, and whitish; tympanites increased; tenderness over abdomen; and still disposed to diarrhœa. ℞. Poultice to abdomen, and continue use of astringents.

P. M. Patient looks depressed; quite deaf; bowels tender; tympanites; tongue moist; temp. 104°. ℞. Repeat quinine, 5 grains every two hours, commencing at 2 A. M., until 20 grains are taken. Then suspend until 12 M., when two more doses are to be given.

Chart I.



Case I. Temperature curve.

26th, A. M. Remission more marked, and temperature 101.5° P. M. Temp. 103.5°; other symptoms same. R. Continue quinine as yesterday.

27th, A. M. Temp. 100.5°; bowels controlled; not so tender or tympanitic.

P. M. Temp. 102.3°; tongue moist and clean; tympanites nearly gone. R. Continue as last two days.

28th, A. M. Patient looks and feels better. Temp. 100°.

P. M. Temp. 100°; patient expresses herself as much better. R. Quinine, 15 grains during night.

29th, A. M. No rise of fever since yesterday morning, and patient desires to sit up. Temp. 99°.

This case is a fair specimen of those cases denominated continued malarial, arrested at the first hebdomadal period; but which, under a less

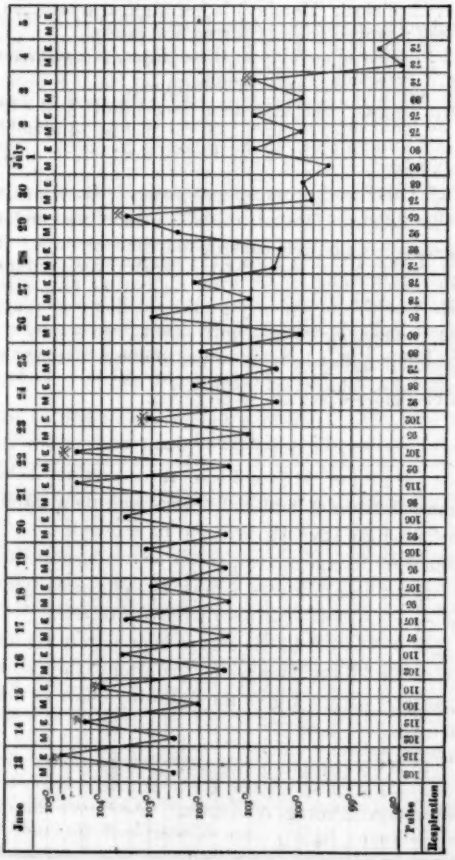


Chart II.

Case II. Temperature curve. ✻ Quinine used.

persistent use of quinine, would have continued to the second or third hebdomadal period, and developed more decided typhoid phenomena. It also illustrates the gradual changes which have been going on in malarial fevers in the last decade.

I will give an outline of two other cases, as typical of the present continued malarial fever, and also as illustrative of the hebdomadal exacerbations in the course of the fever.

Case II. R. S., white, male, 24 years.

This patient was seen on June 13, 1881, the seventh day of the attack. Reported himself as attacked on 6th of June with chill followed by fever of a remittent type and mild grade. On the 13th (first hebdomadal period) had a decided exacerbation of fever.

13*th*, P. M. Found him with fever, temp. 104.6°; pulse 115; slight tenderness over iliac region; and slight tympanites. Bowels acting each day, but no tendency to diarrhœa; tongue whitish, broad, and moist. ℞. Quinine 15 grains latter part of night. The quinine was continued for three days, with decided abatement of fever as indicated by temperature chart. The quinine was then discontinued, and I ordered, ℞. Lugol's solution of iodine ℥ij, carbolic acid ℥ss, water ℥vj. Sig. Teaspoonful every two hours. Fever continued to decline gradually until the 15th (second hebdomadal period), when he had another decided exacerbation of fever. Temp. rose to 104.5° (see chart II.). Quinine, 22 grains were given on 16th and 17th. Temperature again abated, and surface became moist and cool. Tongue furred, and dry in centre. No tenderness or tympanites; abdomen flat; bowels constipated for four days. Bowels acted on 24th without medicine. From 24th to 28th fever gradually declined, and tongue became moist and clean. On evening of 28th (third hebdomadal period) had a distinct chill, followed by increase of fever, which abated next morning. Got on 29th to 30th quinine 20 grains. The fever again abated under the influence of quinine, and the patient now rapidly convalesced, and was clear of fever July 4.

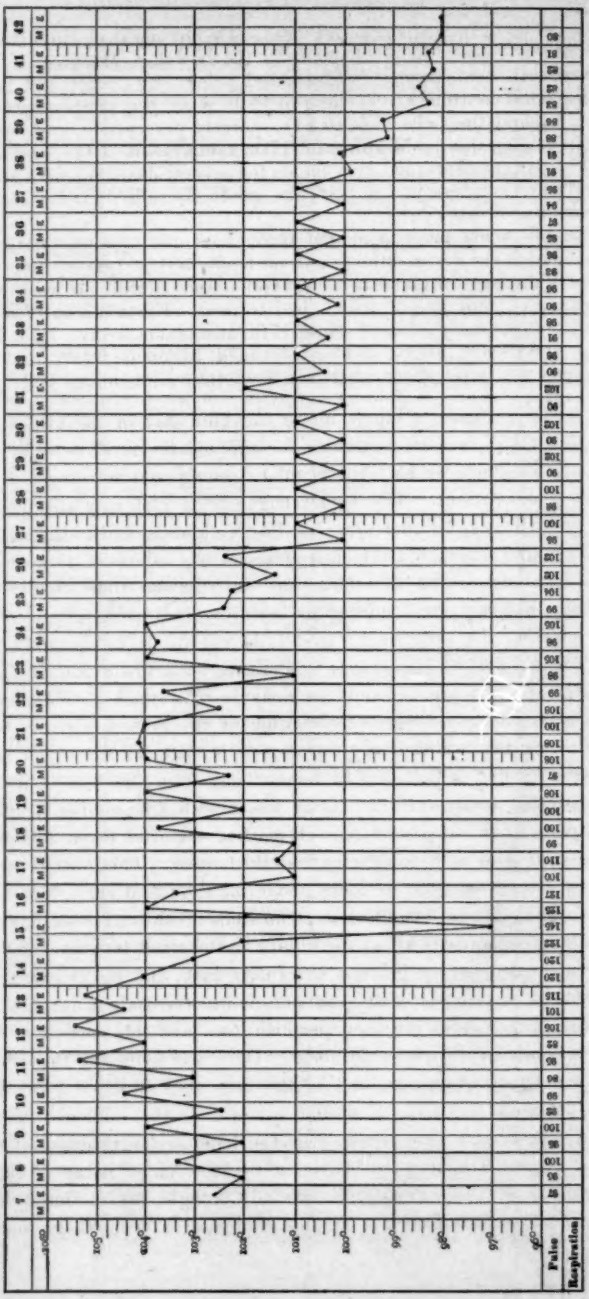
In this case, which continued four weeks, it will be seen that the temperature curve is too irregular for typhoid fever, while the exacerbations on the 13th, 21st, and 29th indicate three distinct hebdomadal periods which is characteristic of malarial fevers, and their habit of returning at the expiration of the seventh day, and its multiples.

The absence of diarrhœa, tympanites, or tenderness in iliac region, and of the rose spots, also militates against classing it as typhoid fever. It is more properly classed as *continued malarial fever*.

Other cases of which I have notes present both in the temperature curve and symptoms, at different stages of the attack, the two sets of symptoms combined in one case. I give the following chart as illustrative of this variety of cases.

Case III. This patient, a coloured girl, 15 years old (nurse for Mrs. Mason), was seen first on eighth day of attack. Reported as having continued fever, with morning remissions. Abdomen flat, no tenderness, no tympanites; tongue lightly furred, with red tip and edges, moist and broad. From 8th to 12th, temperature steadily increased each day, while

Chart III.



Case III. Temperature curve.

the pulse declined in frequency and force. On the night of the 14th day patient had a copious hemorrhage from the bowels. Morning of 15th found her with cool, clammy surface, and pulse very feeble and rapid. This depression continued to evening of 15th, when the temperature had sunk to 97°, and the pulse rose to 147, scarcely perceptible, and surface bathed in perspiration. Morning of 17th, temperature 104°, and pulse 135. The patient continued very feeble for several days, but with stimulants, milk diet, and essence of beef, she gradually rallied, and continued to improve to convalescence.

The bowels remained constipated throughout, the abdomen flat at all times, tongue never dry or brown, and no tenderness or tympanites. On the 22d day the parotid gland became swollen and painful. It was lanced on 28th to give vent to pus which had formed. From 9th to 12th had 15 grains quinine daily; from 15th to 17th, stimulants freely; from 17th to 32d, Lugol's tinct. iodine and carbolic acid, lemonade freely, and surface sponged with cold water whenever temperature was above 102°.

Here we have a case in which, up to the 26th day of the attack, the temperature curve was too irregular for typhoid fever, while from that time to convalescence we have the regular evening and morning rise and fall of a typhoid patient. The hemorrhage on the 14th may also be considered as indicative of ulceration of Peyer's glands, and to this extent points to typhoid fever; but the entire absence of tenderness, tympanites, dark or dry tongue, and diarrhœa, has an opposite indication. The hemorrhage is not to be regarded as certainly indicating ulceration of Peyer's glands. In the present case I do not think it was from this source. There was no tenderness to indicate such ulceration, and the hemorrhage was too profuse and too early in the attack. It was more probably from a deeply congested condition of the mucous membrane of the small intestines, which is not uncommon in malarial fevers. I have seen quite a number of instances of hemorrhage from the bowels in undoubted cases of malarial fever. Only last month (September, 1882) I held a post-mortem on a case of well-marked malarial fever, in which there were two copious hemorrhages from the bowels. The mucous membrane of the ilium for a foot or more above the ilio-cæcal valve was congested to a good degree, but there were no signs of ulceration or enlargement of Peyer's glands. About the middle of the small intestines, for 12 or 14 inches in length, the gut was externally dark, and on examination of the mucous membrane of this portion, it was *intensely* congested; to such an extent as to give it a deep purplish hue; and this portion of the intestine was filled with semi-fluid blood. Here was evidently the source of the hemorrhage in this case, and in the case above related I am disposed to believe it was from a similar source. In the influence of the splanchnic nerve, as a vaso-motor, over the capillary circulation of the abdominal organs, I believe we have an explanation of many of these hemorrhages; and this influence is specially brought into action by the malarial poison, as manifested in the late epidemic of hemorrhagic mala-

rial fever, which still, to a very limited extent, is met with in this county.[1] For these reasons I am disposed to class this case also as one of *continued malarial fever*. It might be designated by *typho-malarial*, using the

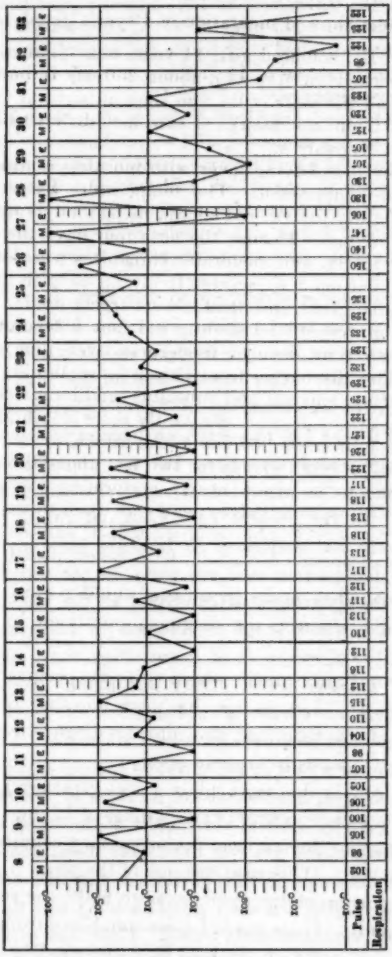


Chart IV.

Case IV. Temperature curve.

term "typho" not as designating a hybrid of typhoid and malarial fevers, nor as indicating a disease distinct from either, but as a descriptive prefix, just as we use the term *hemorrhagic* to denote the variety of malarial fever which prevailed here from 1867 to 1872. But this is misleading.

[1] See Report on Hemorrhagic Malarial Fever, Ala. Transactions, 1876.

I will give tracings of temperature and pulse of one more case, which exhibits still more strongly the characteristics of typhoid fever, and in which post-mortem showed ulceration of Peyer's glands:—

Case IV. N. K., coloured girl, 14 years old. This patient nursed for Mrs. Brown (marked on Map 11), about 250 yards northwest from the old mill-house and the marshy lot, and slept at night at the house of Kennard (marked 12 on the map). I saw her, July 19th, the eighth day of her attack, at Kennard's.

She was reported as having fever with morning remissions; the attack being gradual in its approach. The temperature was A. M. 104°, P. M. 105; tongue slightly furred, red at tip, moist; no tympanites or tenderness over iliac region. During the next four days the bowels were disposed to act too freely, and moderate tympanites was developed.

Her bowels continued to act too freely up to 26th day of attack, notwithstanding astringents and opiates were freely used. The tongue continued throughout moist and slightly red, but not pointed or contracted. There was at no time decided tenderness over iliac region, nor much tympanites. The discharges from bowels were liquid, and of brownish colour. Muttering delirium and subsultus tendinum were developed during the last week; she became constantly more debilitated, and died in a semicomatose condition on 33d day of the attack.

Post-mortem.—Peyer's glands for two feet above ilio-cæcal valve badly ulcerated, some of the ulcers nearly perforating the walls of intestine. One ulcer four inches from valve, nearly an inch in diameter. The solitary glands of ascending colon swollen, bluish, and ulcerated, resembling somewhat a small pustule of variola, with centre pitted.

Here we have what many physicians would regard as a well-marked case of typhoid fever, with the diagnosis confirmed by the characteristic lesions.

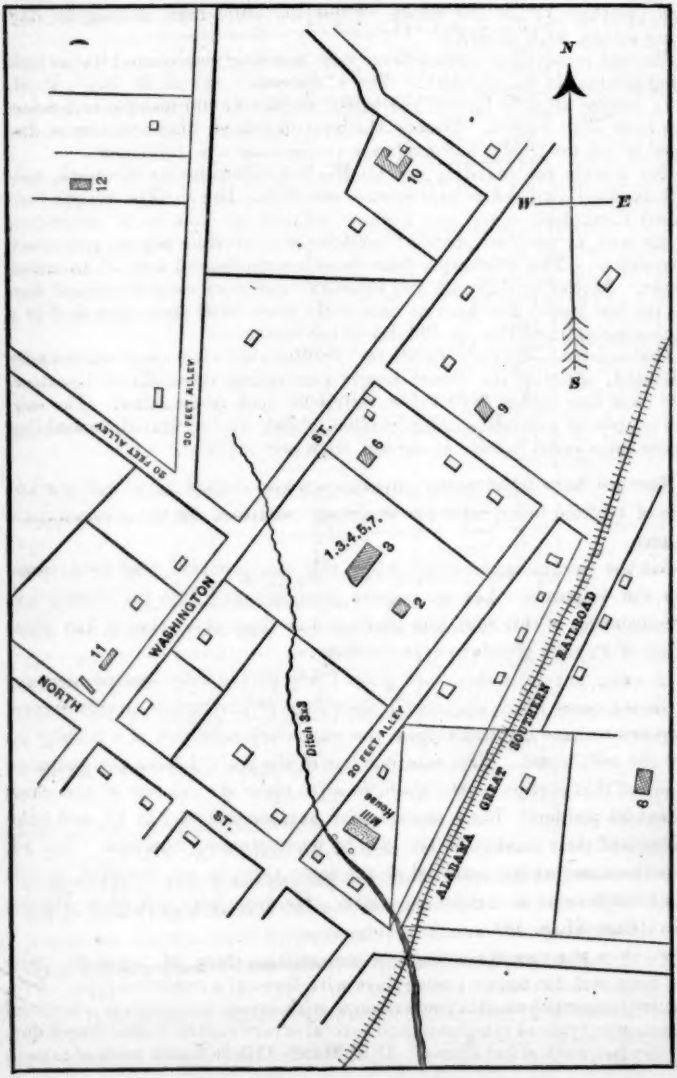
But the circumstances under which this case occurred, lead me to question the diagnosis. Let us inquire more minutely into the history and circumstances of this case, and also into the diagnostic value of the ulceration of Peyer's glands in typhoid fever.

In order to render this more plain I will give a very succinct account of the ten cases which occurred in the village of Livingston, in this county, supposed to have originated from the unsanitary condition of a marshy lot and old mill-house. This case was one of the ten. I have also prepared a map of that portion of the town, so as to make the relation of the cases to this lot plainer. These cases I have numbered from 1 to 11, and have designated their locality on the map by corresponding numbers. No. 10, a similar case, which occurred at the same time, is not included, as this was known to be of a different origin. He came here sick from Macon, Geo. (Case II. p. 457).

No. 1.—Feb. 18, 1881, saw in consultation Mrs. M., aged 40. She had been sick for ten or twelve days with fever of a remittent type. Premature labour (6½ months) supervened, with severe hemorrhage, puerperal septicæmia, typhoid symptoms, and several severe enteric hemorrhages during the last week of her illness. Died March 11th in fourth week of attack.

No. 2.—During the early part of the attack of Mrs. M., a little negro (6 years old), on the same lot, died of a continued form of fever, in the second week of the attack. No physician in attendance.

Nos. 3 and 4.—The latter part of February two little girls (8 and 10 years old), children of Mrs. M., had attacks of remittent fever continuing ten to fifteen days.



Map of Livingston, showing the location of houses in which cases of fever occurred.

No. 5.—March 21st, a little girl (aged 6), of the same family, had an attack of remittent fever lasting eight days.

No. 6.—During March, a negro woman, on an adjoining lot, died from a similar attack of remittent fever, during which, as in Case I., premature labour (7 months) occurred, with severe hemorrhage.

No. 7.—April 30, B. M., a boy of 16, of the Mason family, was attacked.

These cases all had a striking resemblance, and none of them, except the mother (in the last week), exhibited any well-marked characteristics of typhoid fever. And in her case, this is reasonably accounted for by the septic condition following the premature labour.

The tongue in all of them was whitish, broad, and moist throughout. No tympanites, no tenderness over iliac region, no diarrhœa but rather constipation, no rose-coloured spots.

No. 8.—This girl nursed for Mrs. M., was taken sick at her house, but went to her mother's place (Hale's) to be sick. Her case is reported as Case III., p. 457.

No. 9.—H. B., negro, male 70 years old. Also on adjoining lot. I saw this case May 1, had been sick about two weeks. I found him much emaciated; abdomen flat, bowels constipated; tongue slightly furred, red tip and edges, but moist; bronchial respiration, with subcrepitant râles over both lungs; pulse 130, and feeble; temperature 101.

He gradually improved until at end of fifteen days his lung trouble had disappeared, temp. 99°, and he was able to sit up. On May 22, he was quite feeble, bowels constipated. He had very poor nursing (living alone); his diet was poor, and irregularly furnished. He continued to grow more feeble, and died (inanition) on the 27th. No tracings were kept of temperature.

Post-mortem five hours after death. Cadaver very much emaciated; scarcely a particle of adipose tissue; lungs collapsed, free from inflammatory lesions, and very little blood in lung tissue. The heart was large and filled with blood. Bloodvessels on the stomach and intestines filled with blood, giving them a dark hue. Stomach empty, with engorged mucous membrane. The small intestines were empty, containing only a small quantity of mucus. The spleen was very small, shrivelled and nodulated. Liver natural. The duodenum and three feet of the ileum next the ileo-cæcal valve were carefully examined. No trace of ulceration, or enlargement of solitary glands, or Peyer's patches. This, however, was hardly to be expected in one of his age, as Peyer's glands are almost entirely absent in the aged.

No. 11, July 20.—The case of N. K., which gave the ulcerated Peyer's glands. Reported above, p. 461, Case IV.

This was the tenth of a series of cases which had occurred within two hundred and fifty yards of each other (see map). At this time there was no sickness at all resembling this in any other part of the village, and after this case no other case of fever of a continued type occurred in the village within the next twelve months.

What then was the origin or cause of these cases? Such was the question I proposed to myself, as health officer, at the time.

On examination of that part of the village, I found, within two hundred yards of the residence of Mrs. M., where the first six cases occurred, an

alluvial lot of nearly one acre (through which had been cut for drainage purposes a ditch three feet deep), covered from one to six inches, over a considerable part of its surface, with stagnant water, with a greenish scum upon its surface. The ditch had been suffered to fill up, and hence the above condition. In addition to the marshy condition of the surface there were two pools, one 10 by 30 feet, the other 12 by 20, with 12 to 24 inches of water in them. At the bottom of these pools, which had been there for several years, had accumulated mud and trash. When the water in them was stirred, large bubbles of gas freely arose to the surface. An old mill-house on this lot, which was a large, open, frame building, with no floor in one half of it, was used as a slaughter house by the butcher of the village. Here in the unfloored part of the building he had erected a rude stage or rough floor 8 by 15 feet, resting upon poles six inches in diameter, which were laid upon the ground as sleepers for the open flooring. Upon this open floor he slaughtered his beeves, the blood running through the cracks in the floor, saturating the ground beneath, and off at the lower end of the floor, through an open ditch mingling with the surface water, which stood just at the corner of the building. The stench from this was nauseating; and a more filthy and unsanitary place could not well be imagined. But this was not all. In the same building were stored several hundred sacks of Georgia grange fertilizer; the composition of this manure I do not know, but it evidently contains a large part of animal as well as vegetable matter, and emits a very disagreeable odour. Here then was abundant cause for disease.

As soon as the condition of this lot was discovered (April 25), I called the attention of the town authorities to it, in connection with the occurrence of these cases of fever. Measures were taken to drain the lot, and abate the nuisance in the old mill-house, but it was not until late in May that the object was attained. All of the ten cases occurred within two hundred and fifty yards, nearly due north, or to windward of this filthy lot.

The prevailing winds of this place, at that season of the year, are from the south, so that those patients at Mrs. Mason's, where the first five cases occurred, were directly exposed to the miasmatic influences of this filthy lot.

In fact, so completely was this the case, that towards dusk, when the air became a little damp, the disagreeable odour was plainly noticed at this house.

The localities of these cases are designated on the map by the figures denoting the number of the cases in the foregoing *résumé*. Case No. 8, which died at a house to the east of the filthy lot, nursed for Mrs. M., and was taken sick at her house. Case marked 12 nursed Mrs. M. during her illness, and was constantly day and night with Mrs. M. This patient was not sick until in August.

The circumstances here given point to the filthy lot and slaughter house, as the *source of the poison*, which gave rise to these ten cases.

This being admitted, and I think there can be no doubt of it, we are shut up to one of two conclusions, viz.: either they were *malarial* fever, originating in the foul miasmata of this lot, or if typhoid fevers, they *originated de novo*, from the same source. The latter does not accord with the generally received view of the etiology of typhoid fever; and since the symptoms in none of them, except No. 10, are characteristic of typhoid fever, I believe we are justified, even with ulceration of Peyer's patches in one of them, in classing them as continued malarial fever. Let us now examine the pathognomonic, or diagnostic, value of ulceration of Peyer's patches in typhoid fever, as bearing upon this case. To question this seems rash, yet, at the risk of such a charge, I submit the following:—

(1) The question, whether or not any specific substance is eliminated from the glands of Peyer, is by no means settled. Some have indeed assumed that the disease is peculiarly liable to transmission by means of the alvine evacuations, which also requires proof; and, if so, would not necessitate the idea that this peculiarly poisonous state was the result of any specific elimination from these so-called glands. Jones and Sieveking, in their *Pathological Anatomy*, say:—

"The matter which causes the tumefaction of the agminate and solitary glands is simply a kind of albuminous exudation, not differing we believe essentially from any other. It either, which is most frequent, forms a solid mass, imbedding the natural nuclei of the gland, or affords a plasma, out of which these nuclei develop colloid particles. Black granules and grains of pigmentary matter are often present in it, but they are by *no means peculiar to the typhoid state*. They give to the glands a black dotted appearance, as seen by the naked eye, and this we have observed more than once after death *from other causes than fever*." (p. 494.)

Aitkin (vol. i. p. 385) says:—

"The specific character of the elements composing the growth cannot be shown to the eye even by microscopic examination. There is nothing in it to distinguish it from other elementary morbid products, which are deficient in the power of organization. . . . . The new growth has no specific structure to distinguish it from other morbid growths (Wedl, Virchow, and others); and, although a specific 'typhus cell' has been described and figured by Gruby, Vogel, Bennett, and others, its existence is not proven."

Prof. Klebs also thinks he has discovered the "Bacillus typhosus," and publishes his observations and experiments, which are to some extent confirmed by Prof. Eberth. From experiments upon rabbits with the carefully cultivated bacillus typhosus, Prof. Klebs considers himself justified in the conclusion

"that the bacillus typhosus, under favourable conditions, develops in the mucous membrane of rabbits into the same thread-mycelium as can pervade the whole mass of a typhoid infiltration, and fill the bloodvessels in the human intestines." (*Amer. Jour. Med. Sci.*, Jan. 1882, p. 251.)

These observations, like those of the same investigator upon the "bacillus malariæ," need confirmation, before they can be received as proven. There is, then, upon this ground, no well-founded reason to regard these ulcerations of Peyer's patches as peculiarly typhoid.

(2) Again the morbid development and ulceration of these glands are such as we might expect under a long-continued, or highly engorged or hyperæmic state of the mucous membrane of the intestines from whatever cause. This we would infer from their anatomical structure. After speaking of their structure as differing from the Lieberkühn tubes or follicles around them, Jones and Sieveking say:—

"They are, from their very structure, solid aggregated masses of nuclear particles, peculiarly liable to become enlarged and prominent, the nuclei attracting to themselves plasma, and developing into cells . . . when the inflammation reaches a certain point, they are extremely apt to suppurate and slough." (pp. 489–490.)

Why, then, may we not have these patches of nucleated particles attracting to themselves plasma under other sources of engorgement of the mucous membrane than in typhoid fever? We have seen that in malarial fevers this engorged condition of the mucous membrane exists to the same extent as in typhoid fever, and when this becomes long continued, as in the continued malarial form of fever now prevalent here, why may we not have, in these also, enlargement and ulceration of the solitary and agminated glands of the intestines? There is no sound pathological reason for a denial of this, and if clinical experience sustains it, why not acknowledge the fact, though it may militate against preconceived opinions?

(3) In a large number of fatal typhoid cases, these characteristic lesions are not found, and no doubt, if the cases which recover could be examined, this characteristic "anatomical sign" would be absent in a majority of cases.

Dr. Atkinson says, "taking into account the fact that a large proportion of the cases of typhoid fever recover, it seems to me that this mode of elimination (ulceration of Peyer's glands) occurs much less frequently than the mode already described," which is elimination without ulceration.

Jones and Sieveking, giving an epitome of the account of Rokitansky's views of the changes which take place in the intestinal mucous membrane in continued fevers, say:—

"The intestinal affection, as is well known, is no necessary part of the fever. We have examined the intestines of persons dying of fever, in which very little trace of Peyerian patches or solitary glands could be detected, certainly less than we have seen in the bodies of persons who have died of other diseases."

(4) But they are not only absent in many cases of typhoid fever, but pathological researches show them to be present in other diseases. Thus Dr. Copland, quoted by Jones and Sieveking, speaks of glandular or follicular enteritis as occurring in continued or *remittent* fevers, *dysentery*, and *tuberculosis*.

At a meeting of the New York Pathological Society, held Oct. 26, 1881, Dr. Heineman called attention to the case of a man who had died in Roosevelt Hospital from fracture of the skull. The post-mortem, among other lesions, revealed well-marked *shaven-beard* appearances of Peyer's patches. Dr. Heineman directed attention to the fact that this condition of Peyer's glands was frequently found associated with other diseases than typhoid fever; and also to the fact that it was found in only a part of the cases of typhoid fever. He stated that Dr. Janeway had informed him that, during the last epidemic of typhoid fever which occurred in New York, Peyer's patches were not involved in the cases in which he had opportunity to make post-mortems. Heineman had seen shaven-beard appearance associated with three distinct diseases—meningitis, cholera morbus, and general pyæmia—and Dr. Delafield had seen it in an extensive burn."[1]

Dr. Stokes (*Lectures on Fevers*, p. 137).

"In the outbreak of 1826–8 (if ever there was a true typhus fever, it was then), in a very large number of cases, the secondary local disease of the intestine, considered to belong to the typhoid form, was present."

Dr. Anderson, as quoted by Hudson (*Lectures on the Study of Fevers*), speaking of a case of *scarlatina*, says:—

"We found the mucous membrane of the duodenum covered with enlarged solitary glands, softened and ulcerated, so that in some places the peritoneum alone remained of the coats of the bowels. Peyer's glands were enlarged throughout the greater part of the jejunum and ileum, a patch in the lower part of the latter being about five inches long." "Jane S. died of asthenic confluent *smallpox*, at the period of maturation. We found on the mucous surface of the ileum a number of enlarged Peyer's glands, two of which were ulcerated."

If, then, these ulcerations are absent in a large proportion of typhoid cases, and when present do not exhibit any specific characteristics, but seem to be the result of that hyperæmic condition of the mucous membrane common to this and other fevers, and are found also in many other diseases, are we justified in claiming this anatomical lesion as pathognomonic of typhoid fever?

To return to the case of N. K. (No. 11), in which this ulcerated condition of Peyer's patches was found, but in which the circumstances of its origin, with the absence of many of the prominent symptoms of typhoid fever, indicated it to be *malarial*, are we to be shut up from the presence of this one anatomical lesion, to the diagnosis of typhoid fever? Or rather, may we not expect, in protracted cases of continued malarial fever, to meet with these ulcerations of Peyer's patches, as the natural sequence of the hyperæmic condition of the intestinal mucous membrane, which we know to exist in these cases, and to which we may also reasonably refer the enteric hemorrhages which sometimes occur?

[1] Dr. Blow, Transactions Med. Ass. Ala., from New York Medical Record.

After an experience of over a quarter of a century in this country, during which time I have closely watched the different phases of malarial fever, I am disposed to favour the latter view.

The decidedly *remittent* character of the fever at its outset—temperature ranging from 101 or 102° in the morning to 104 or 105° in the evening; the well-marked hebdomadal periods, corresponding with the well-known hebdomadal returns of recurrent intermittent and remittent fevers; the moist, broad tongue coated with a whitish fur, rarely, even in the severe cases, becoming painted, red, dark, or dry; the bilious vomiting at the commencement of the attack; its more sudden onset, with greater chilliness; the flat abdomen, with constipation, and absence of gurgling, tympanites, and tenderness over iliac region; the absence of sudamina and rose-coloured spots; the general absence of enteric hemorrhage, and when it does occur its greater profuseness and earlier occurrence (being usually in the second week); the absence of epistaxis, and the decided influence of quinine over the fever in its early stages, often checking it at the end of seven to ten days, all indicate a disease different from typhoid fever.

Nor am I disposed to regard the fevers of our section as *hybrids* of malarial and typhoid fevers. These may be possible, but the evidence of their existence here is wanting.

The gradual and marked changes of our malarial fevers, constantly tending to a typhoid form, are sufficient to account for a continued *malarial* fever, with typhoid symptoms, such as we have here.

Besides, the circumstances under which these cases occur (sporadic, isolated), with none other than the ordinary miasmatic influences to account for their origin, and all absence of evidence of an infectious character, which is now an admitted feature of typhoid fever, point them out as purely malarial.

If, however, it be admitted that the gradual changes in malarial fevers are sufficient to account for a continued fever whose symptoms are so similar to typhoid fever as to puzzle many acute diagnosticians, and cause others to contend for the existence of a fever blending the phenomena of the two; and, morover, if in some of these cases the characteristic anatomical lesion of typhoid fever appears, the question naturally arises, *where is the difference* between the two? It does not follow, necessarily, because two fevers have striking resemblances, and one of them may occasionally present the anatomical lesion which is considered as characteristic of the other, that they are identical.

We have seen that there is nothing specific in the ulceration of Peyer's glands; that it does not exist in a large proportion of fatal cases of typhoid fever, and is sometimes wholly absent in epidemics (in New York, Janeway, and in Philadelphia, Da Costa); and that it is not peculiar to typhoid fever, but is found in many other diseases.

Dr. Stokes, after noticing the resemblances between typhus and typhoid fevers, and the fact that ulceration of Peyer's glands was frequently seen

in the former, especially in the great epidemic in Ireland in 1826–8, still speaks of them as distinct species of fever. Why, then, may we not have these resemblances between malarial and typhoid fevers, and yet each one retain its identity? They, like all other fevers, are related *generically*, but are of *different species*.

Yet it should be remembered that since the discoveries of Darwin, the *species* are not regarded as so fixed and definite, in the vegetable and animal series, as they once were. Probably, too, the strenuous efforts within the past fifty years at differentiation, and designating diseases by *names* intended to denote *specificness*, has tended too much to overlook their *resemblances*.

If, as already indicated, and which late researches make probable, the causes of the different fevers are to be found in the varieties of the fungi, or algæ, as bacteria, bacilli, or micrococci, may we not, by a reverse deduction, trace them back to a single parent variety or germ? Where these deviations commenced, or when they reached the point of specificness, we may not be able to determine.

From this point they may evolve until they reach specific characteristics, and then run on in the same channel for an indefinite series of years; yet it is within the scope of reasonable hypothesis that any one branch of the series may again subdivide in such a manner as to reproduce or closely approximate some recognized species. This is in strict accord with the principles of evolution as laid down by Darwin in his Origin of Species.

Thus may not the cause—the specific germ—of malarial fever, gradually undergo changes until it may, under favourable conditions, produce a type of fever closely resembling typhoid fever, yet preserving its specific identity sufficiently to be classed as malarial? There is nothing inconsistent in the hypothesis, and it accounts well for the hybrid appearance of the phenomena without supposing the joint action of two distinct poisons of a general and specific nature acting at the same time in the same individual.

Dr. Stokes, in his *Lectures on Fever*, speaking of the causes of the change from the "sthenic to the asthenic type of diseases" (p. 12), quotes Dr. Allison as saying:—

"When we reflect on these facts, we cannot think it unlikely, either that *all causes* capable of exciting diseased action in the animal economy, or, more probably, that the liability to diseased actions in the different departments of the animal economy itself, are *subject to variations* which are made known to us only by the variation of the phenomena themselves."

Again, Dr. Stokes says (p. 39):—

"The attention of physicians has been awakened to the doctrine of the correlation of zymotic diseases (*Zymotic Diseases, their Correlation and Causation*, by A. Wolf, F.R.C.S. Eng. 1872), a doctrine which has been long suspected to be true by practical men. Yet, it may be asked, can we not go a step further, and consider whether essential diseases are not *convertible* as well as correlative?"

Medical research and opinion of the present day tend to the separation rather than to the convertibility of specific diseases, yet it must be admitted that there are many marks of correlation between the essential fevers. Thus, in the great typhus epidemic in Ireland, in 1826–7, Dr. Stokes gives instances in which the two fevers, typhus and typhoid, originated in the same family at the same time under similar circumstances. "One patient may be a maculated typhus; in another there is no eruption; or in another the case is typhoid, or the so-called enteric fever." (p. 51.)

Again (p. 135):—

"That follicular disease of the intestines is commonly met with in typhoid fever, as compared with typhus, may be admitted; but what I want you to perceive is, that there is between them a great generic resemblance. Much has been written to prove that dothinenteritis may be taken as the anatomical character of typhoid fever, and some go so far as to deny the occurrence of ulceration of the intestines in maculated typhus. Yet no man who has observed this fever in an Irish hospital, will subscribe to such a doctrine." "In a very large number of cases, the secondary local disease of the intestine, considered to belong to the typhoid form, was present." (p. 137.) "The tumefaction and ulceration of the ileum were found well marked in a number of cases, so that if those who advocate a different doctrine had been here at the time, and had made dissections in this hospital, they could never have defended this opinion." (p. 143.)

Seeing, then, that fevers are so closely allied generically, and that even when separated into species, there are striking resemblances; that pathological researches do not establish a constant anatomical lesion, which is pathognomonic of any one of them; and that ulceration of Peyer's glands (claimed as characteristic of typhoid fever) is frequently found in other diseases, are we not justified in claiming that a *continued fever*, occurring under circumstances which point to a miasmatic origin, although it may present many of the vital phenomena of the typhoid fever, and occasionally its recognized anatomical lesion, is still *malarial* fever?

There remains, to my mind, but one other explanation of these continued fevers, viz., that they are to be regarded as atypical typhoid fevers, originating *de novo*.

But, admitting the origin, *de novo*, of typhoid fever from animal miasm, and that possibly it may have thus originated in the example I have given (for I have intentionally chosen one suited in some respects to this theory), even the warmest advocate of this view will be unable to bring those sporadic, isolated cases which occur again and again in *malarial*, but otherwise salubrious and healthy country localities, within the rôle of such instances as are claimed as establishing this mode of origin.

The natural conclusion, taking all the facts into consideration, is that they are *malarial fevers* of a typhoid form, using the term typhoid, not in a specific sense, but as indicating a typhoid condition of the system.

LIVINGSTON, ALABAMA, November, 1882.

ARTICLE XIII.

A CASE OF COLOUR-BLINDNESS FOR GREEN.

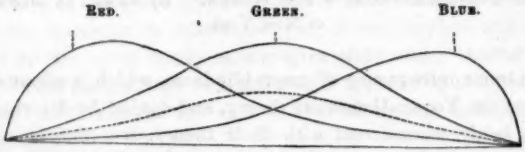
By JAMES L. MINOR, M.D., of New York.

THE extreme infrequency of green-blindness, which is admitted by the followers of the Young-Helmholtz theory, and denied by Herring and his school as being inconsistent with their theory, is sufficient reason for bringing forward this case, which I saw last summer.

A. B., æt. 18, male, consulted me at the New York Eye and Ear Infirmary, saying that he was subject to the constant criticism of his employer concerning mistakes committed in selecting the different shades of *green* in sorting cigars, preparatory to packing in a large tobacco factory in this city. His vision was perfect, and the fundus was normal, but he was unable to select green from certain other colours, while blue and red were quickly and accurately recognized. Holmgren's colour-test was the first one used. He was given a light green skein (I), and told to select skeins of a corresponding colour. Greens, grays, drabs, dark yellows, and light browns were carefully collected and placed together. He was next given a rose-pink coloured skein (IIa), which was accurately matched with skeins of a like colour. And finally a bright red skein (IIb) was given, with which he correctly placed the reds. I now tried Daae's test-chart, which consists of a perforated card, on which are woven ten horizontal rows of coloured worsted, in blocks of three strands each, with seven blocks to the line. Eight out of the ten horizontal lines are made up of blocks of different colour. The remaining two represent, respectively, shades of *green*, from light to dark, and shades of *red* from light to dark. The patient, without hesitation pointed out the red line as containing blocks of the same colour.. The green line was passed over, and the line above, which contained greens, drabs, and light browns, was selected as being the only other on the card containing blocks of the same colour.

The result of these examinations is peculiar in that it shows the individual to have been colour-blind, without indicating the variety of colour-blindness, in a way that the tests are supposed to do. The patient was practically green-blind, however inconsistent that fact may be with theory; and to make the two harmonize, as also to explain such phenomena, the Young-Helmholtz theory is most satisfactory. If we recall the diagram used by Helmholtz to illustrate the colour curves, it will be seen that each one of his three primary colours (red, green, and blue) is perceived with a certain admixture of the other two—*i. e.*, a ray of light that gives to us the sensation of blue, acts powerfully upon the blue perceptive elements and to a lesser degree upon those for green and for red; and in a similar

manner when *red* and *green* are perceived, the colour is not strictly a pure one, but is mixed with a small quantity of the other elementary colours. See diagram.



The unbroken lines indicate the curves showing the action of the spectral colours upon the three colour-perceptive elements; and the dotted line, the colour curve for green in the case here related.

In absolute colour-blindness for any one colour, green we will say, the retinal substance with which green is perceived is entirely absent, and the eye is then reduced to dichromatic vision; red and blue will be perceived, while other colours will be recognized as different shades of red and of blue respectively, in proportion to the preponderance of the one or the other colour. My case evidently does not come under this head, for blue and red were accurately recognized, and other colours were not confounded with them. Green and colours containing green had a colour peculiar to themselves, while the power of discriminating these colours one from another did not exist. The green perceptive elements in the retina were so far reduced that they could not be acted upon without setting up at the same time an undue action in the red and the blue perceptive elements which are in greater abundance than in the normal state; and thus a mixed sensation is excited, that furnishes the colour zone in which green and its derivatives are placed by the patient.

233 MADISON AVENUE, NEW YORK, Nov. 1882.

REVIEWS.

ART. XIV.—*Syphilis.* By V. CORNIL, Professor in the Faculty of Medicine of Paris, and Physician to the Lourcine Hospital. Translated, with notes and additions, by J. HENRY C. SIMES, M.D., Demonstrator of Pathological Histology in the University of Pennsylvania, and Assistant-Surgeon to the Episcopal Hospital, Philadelphia; and J. WILLIAM WHITE, M.D., Lecturer on Venereal Diseases, and Demonstrator of Surgery in the University of Pennsylvania, and Surgeon to the Philadelphia Hospital. 8vo. pp. xvi., 461. Philadelphia: H. C. Lea's Son & Co., 1882.

WE are forcibly reminded by this volume of the man who going to add a porch to his house made it of such a size and excellence as to well-nigh dwarf the original structure. Not that there is anything inferior in the original lectures of M. Cornil, but that the American editors have contributed such large and valuable additions that the book must always be regarded as the composite work of author and editors.

Taken as a whole, it well represents the present position of syphilographers, and from the peculiar fitness of its authors for the execution of their task, must take a high place among authoritative and standard works.

While the book is amply illustrated, there is altogether wanting that pictorial element which has heretofore added so largely to the cost of similar works. The handsomely coloured lithographs to which we refer have never seemed to us to serve any very useful purpose. They have helped to horrify, and at the same time attract, younger students, and have therefore tended to stimulate the sale of the books containing them, but comparatively few of them convey any real instruction. Instead of such pictures there will be found in this book a large number of drawings, presenting the histological appearances of syphilitic lesions. These woodcuts are fairly executed, but not in the least diagrammatic, giving very faithful representations of the actual view obtained by the eye upon looking into the eye-piece of the microscope.

The American editors have altered M. Cornil's arrangement, and have converted his lectures into chapters, which seems to us to be a very desirable change in view of the important and systematic character of the book. In the first chapter M. Cornil defines syphilis as an infectious, contagious, and inoculable disease, of slow evolution, starting with the infecting chancre, and proceeding through the various manifestations known as secondary and tertiary symptoms. The American editors then give a very able and very valuable analysis of Mr. Hutchinson's modification of this definition, with a *résumé* of the lymphatic theory of Dr. Otis, which they regard as the most likely to be true, as certainly presenting the fewest difficulties, and as most consistent with observed facts.

Mr. Hutchinson regards syphilis as a specific febrile disease, like small-

pox or measles, dependent upon contagion, having a period of incubation, of outbreak (primary symptoms), of efflorescence (secondary symptoms), and certain sequelæ (tertiary symptoms). Drs. White and Simes go on to show that while there is a striking analogy perceptible, the resemblance is not precise or accurate. For instance, this theory does not account for the invariable appearance of the primary lesion at the point of inoculation. Nor does the gradual invasion of the system through the lymphatics in syphilis correspond to the complete invasion of the exanthemata. Thus our authors are satisfied that in a certain number of carefully observed cases excision of the primary sore has resulted in complete protection of the system from invasion. Then, the claim of Mr. Hutchinson and many others, that the true syphilitic sore is not auto-inoculable, is not admitted by certain syphilographers, who maintain that if the inoculation is practised during the incubative stage a second true chancre can be produced, and whose claim that second attacks of syphilis are notably more common than are second attacks of any of the exanthemata, would seem to deprive the theory of Hutchinson of one of its principal supports.

The theory preferred by Drs. Simes and White, as most nearly reconciling the difficulties presented by observed facts, although as yet lacking in actual demonstration, is that which regards the lymphatics as the channels by which the disease invades the system and in which its principal manifestations are seated. The infecting body in syphilis seems to be a degraded cell, resembling a white corpuscle, but smaller, which has the property of rapid proliferation, and the well-recognized ability of diseased cells to infect their neighbours. These degraded cells attack the white corpuscles of the blood, and, by preventing their transformation into red corpuscles, produce the well-known syphilitic anæmia. These cells are always found at the point of inoculation, and it is their large number which causes the primary induration of the sore, and by compressing the bloodvessels, produces the dryness of that sore by hindering the transudation of serum, while the abrasion or ulceration of the sore is traceable to the interference by these same crowded cells with the blood-supply of the epidermis. The period of incubation is that during which the proliferation and multiplication of these degraded cells is taking place at the point of inoculation, and during which period the system is uncontaminated, while the interval between the appearance of the initial lesion and that of the secondary symptoms, represents that occupied by the slow passage of these same multiplying cells through the lymphatic channels and glands, producing engorgement and the characteristic enlargement. That the poison of syphilis gains access to the system through the lymphatics has been demonstrated by several observations of Fournier.

The continued growth of these syphilitic cells after they reach the bloodvessels is made to account for the roseolous eruptions and insensitive spots, by their interference with the walls of the vessels, and ultimately with the nerves, by pressure.

Further on these cells escape into the papillæ, and multiplying there produce by pressure the local disturbances which result in the papulosquamous, the pustular, and the ulcerative syphilides. Meanwhile the lymphatics continue in a state of irritation, and from that, and the consequent obstruction, we have the tertiary gummæ, necroses and ulcerations. By adopting this theory, which has been prominently brought before the profession by Dr. Otis, we have no difficulty in understanding the curative effect of mercury, which induces fatty degeneration in the syphilitic

cells, and their liquefaction later on, by iodide of potassium. Although our authors deem it wise to refrain from final judgment, they hold that the theory is not only attractive, but presents fewer difficulties than any other. As regards the nature of the virus which causes the primary cell disease, and the long train of pathological changes well known in syphilis, we know nothing, nor have experiments in the same line as those of Villemin and Pasteur resulted in any definite advance as yet.

As regards the mode of communication, the view now almost universally held by syphilographers is held by the authors of this volume, that the infection, while ordinarily derived from sexual intercourse, often has its origin from contact of the buccal mucous membrane with a diseased surface, from a common drinking cup, or as in many cases of physicians whose hands have become infected in the course of surgical manipulation. While secondary lesions very often, if indeed they do not generally, convey the disease, its first manifestation is always a true chancre. This we believe to be an invariable rule. Inoculation with the blood of a syphilitic subject has sometimes resulted in producing a chancre, but there seems to be no certain evidence that such a result has followed inoculation with any of the secretions of the body. Of course the number of reliable experiments in this direction is very limited, as the inoculations with the pus of chancroids, or simple venereal ulcers, practised some years since were almost entirely nugatory, and the insertion of true syphilitic virus in a healthy person is a measure which few conscientious physicians will adopt, and which M. Cornil thinks should never be done without the consent of the subject. Indeed we cannot understand how any man, aware of the ravages which may attend this disease, would permit himself to perform the operation whether his subject was willing or not, for we should take it for granted that the consent could only come from ignorance.

However derived, the virus, either from a chancre or a secondary lesion, always produces the infecting chancre after a certain incubation, and the other symptoms are always regularly evolved. The experiments of Diday go to show that tertiary lesions cannot be successfully inoculated.

The very important question, whether when the chancre appears the patient already has syphilis, does not seem to be settled in the mind of M. Cornil, while his American editors seem to be equally in doubt. The doctrine taught for many years, and still maintained by the majority of syphilographers, that during the incubatory stage the system becomes infected, and that the chancre is the first manifestation of that infection, has had doubts thrown upon it of late by the experiments of Auspitz, Paul Unna, and others. The matter is so important as to warrant especial attention. Ricord, as far back as 1845, taught that by destroying the primary sore we could prevent systemic infection, but as M. Cornil points out, that was at a time when the true infecting chancre was confounded with the simple venereal sore or chancroid. Of 23 cases in which Auspitz and Unna practised excision of chancres, 14 escaped general infection, but the remaining 9 had constitutional syphilis. Now in view of the fact taught farther on in this book, and strictly in accord with the observation of most surgeons, that it is impossible to make a positive diagnosis whether a given sore is a true chancre, or only a simple venereal ulcer or chancroid, we fail to see any thing very conclusive in the result of these excisions. When the American editors come to speak of these experiments, as they do in a valuable note, giving a summary of modern opinions, they say :—

"It will thus be seen, that there is great difference of opinion among syphilographers upon this point, but that the weight of authority is against the *probability* of the abortion of syphilis by excising or otherwise destroying the chancre. Our own experiments in this direction are not yet sufficiently numerous to justify generalization; but we may venture to say, that the results thus far obtained appear to favour the theory which regards chancre as a local development and not as necessarily a symptom of general syphilis."

Now when the observations of our authors are "sufficiently numerous to justify generalization" we know none whose opinions will have greater weight with us, but in the mean time we cannot attach much importance to so cautiously worded a statement as that which informs us their few observations "appear to favour the theory." Nor, when we come to examine the summary they present of the opinions of authors of acknowledged reputation, do we think they are justified in claiming "that there is great difference of opinion among syphilographers upon this point."

The authors quoted are Bumstead, Zeissl, Mauriac, Isidor Neumann, Berkeley Hill, Hutchinson, Van Buren and Keyes, Jullien, Belhomme and Martin, Diday, Lee, Kölliker, and Otis, and with the exception of Kölliker every one of them expresses a want of confidence in the practice of excision. Hutchinson indeed "finds it very difficult to believe that absorption of the syphilitic virus is so rapid," but he would act as if the limitation to the seat of inoculation "comprised the first week or ten days after contagion." If he means exposure by the word contagion, the true chancre does not appear within that time, and, as Drs. Simes and White point out, it is in direct opposition to his own exanthematous theory. Otis does not believe in excision, although the procedure is in harmony with his theory. Kölliker alone concludes that in certain cases, which at present cannot be designated with certainty, extirpation of the primary sore serves to prevent general contagion, and that the initial indurated sore is not to be considered as a symptom of complete general infection. Instead of there being "a great difference of opinion among syphilographers upon this point" it seems to us that there exists unusual unanimity of opinion, the only dissentients being Auspitz and Unna, with the cautious statements of Kölliker, and Drs. Simes and White. Although we have thus ventured to criticize the terms employed by these last, their candour in presenting the whole subject is admirable.

It is not our intention to dogmatize upon this point, for the case will not admit of it, nor are the experiences of Auspitz and Unna to be disregarded. It is quite evident that they have had weight with M. Cornil, and that in addition to Kölliker, the confidence with which others rest upon the old theory has been somewhat shaken, while the disposition to look favourably upon the early excision of chancres is very manifest in Drs. White and Simes. The matter is still most emphatically undetermined, and it seems to us more than likely that the universal judgment of the profession will ultimately be adverse to the local theory, as the weight of authority is even now "against the *probability* of the abortion of syphilis by excising or otherwise destroying the chancre."

The time which elapses between exposure and the development of a chancre is variously stated, but there is a manifest inclination among observers of late years to extend this stage of incubation, which according to Jullien seems to be in accord with the apparently decreasing severity of syphilis. While occasionally cases in which the chancre has appeared within one, two, or three days from the date of exposure are observed, the average incubation appears to be about twenty-four days. The

American editors have several times seen an ulcer follow exposure in two or three days, which has been the precursor of constitutional disease, but have never noticed characteristic induration before the seventh day. They think it a safe general rule to assume that a suspected sore is the initial lesion of syphilis when ten days have passed since the last exposure.

Chapter II. is occupied as well with an anatomical description of chancre. We have not space to go into an analysis of the elaborate histological details comprised in this chapter concerning the changes which take place in the epidermis, the derm, the connective tissue, bloodvessels, nerves, and lymphatics. These changes as revealed by the microscope are minutely detailed but do not admit of condensation. We must refer our readers to the work itself, where they will find the appearances made plain by numerous wood-cuts.

Although the work has to do with syphilis, in the third chapter is given a good account of the soft chancre, chancroid, or simple venereal ulcer. There is none of the sclerosis of vessels which distinguishes the chancre, and the fibrous trabeculæ of the derm are broken down, thus accounting for the great differences which mark the progress of the two affections. In fact the appearances in a chancroid are simply those of inflammatory change. The chancroid is always an ulcer, while the chancre is a papule, an increase of tissue rather than a destruction of it. For although the surface of a chancre is eroded, it is an erosion of an elevated thickened portion of the derm. The eroded surface is smooth and glazed, being bathed in fluid, and there is very rarely any excavation. The induration which very soon makes its appearance is in certain rare instances absent, and it is this fact that makes the coexistence of slight and painless lymphatic engorgment so valuable a diagnostic sign. According to Fournier in three out of four cases the chancre is single, but in about 25 per cent. multiple chancres exist, varying from three to nineteen in number. This is contrary to a very general view, the solitariness of chancre being often referred to as a diagnostic mark, but the authority of Fournier is too high to admit of dispute. It is noticeable, however, that when there are multiple chancres they all begin at the same time, and are not produced in succession as is the case with chancroids. M. Cornil concludes that the inoculation of pus from the sore upon the person of the patient will settle the matter, the failure to obtain a decisive result by this method proving that the sore is not a chancroid, and that its success shows the suspected sore to be a veneral ulcer or soft chancre. From this conclusion Drs. Simes and White dissent and quote the authority of Mr. James R. Lane, who with an experience of seven thousand inoculations maintains that a soft sore may with certain precautions be produced by inserting the secretion of a true chancre. The fact would seem to be that when a chancre is irritated and its surface bathed in pus, inoculating the patient with its secretion produces a sore, a chancroid, by pus contagion, as it is claimed has followed inoculation with the pus of acne.

The nature of the soft chancre, chancroid, or simple venereal sore, has always been a matter of more or less discussion, and although by one class of writers consigned, and as we think very properly, to a class of its own, by others its identity with true syphilis has been maintained, while of late years there have been found very competent authorities prepared to deny that it is either syphilitic or in any way specific. Those who still regard the chancroid as the initial lesion of syphilis account for the absence of constitutional symptoms upon the theory that the free suppuration which

exists eliminates the poison. The majority of surgeons at the present day, however, look upon the chancroid as resulting from a peculiar specific poison, which is propagated from case to case, and which gives rise to the characteristic appearance and course of such sores. Such, as we have said, is the opinion of the majority of surgeons to-day, and M. Cornil is himself among the number. But the American editors are undecided in their opinion, and seem inclined to side with those who deny that chancroids are in any way dependent upon a specific cause, but hold that they originate altogether from what they term pus contagion. The reasons for and against this theory are given by the editors in one of their overshadowing insertions, which we briefly summarize for the benefit of our readers. 1. There is no period of incubation, which is true of no other specific disease. 2. One attack does not protect against a recurrence. 3. Sores similar to chancroids have been produced by inoculation with the contents of acne pustules. 4. The arrangement of the connective tissue in the glans penis, the usual seat of chancroids, and their rapid development explain the characteristic appearances. 5. Chancroids elsewhere than on the glans are very rare, which fact accounts for their absence from the fingers of surgeons. 6. Ulcers on the glans from balanitis, when complicated with phimosis, are usually indistinguishable from chancroids. 7. Competent observers are convinced that they have seen secondary symptoms follow a sore having all the characteristics of a chancroid, especially when seated on the root of the penis. That such cases occur is claimed to be a clinical fact, and is explained by the unicists on the ground that as all chancroids originate from syphilitic inoculation, in such cases there has been only an idiosyncratic failure to escape by the elimination of the poison by suppuration, while the dualists account for the anomalous result upon the ground that the chancre has been a mixed one. This last explanation is objected to by the editors as resting upon mere hypothesis, and involving a belief in the frequent occurrence of what must be from its very nature an exceedingly rare accident, though why it should be more rare than the few trustworthy cases observed they do not inform us. 8. While confrontation generally shows the hard sore to have been derived from a hard sore, and a chancroid to have come from a suppurating sore, in some cases a chancroid proves to have been derived from a secondary lesion suppurating freely, or even where the woman has only a purulent vaginitis. Such cases the editors think hard to explain by the dualistic theory but readily understood in the light of "pus contagion." The only wonder to us is that if "pus contagion" exists there should not be even more chancroids than there are. 9. Repeated inoculations with the pus of chancroids show a progressive enfeeblement of the virus, which is not the case in other specific diseases. 10. Experimentation has proved that when a hard chancre is irritated so as to secrete pus, inoculation with its secretion will produce chancroids capable of reproduction through a lengthy series. 11. Phagedæna supervening upon a syphilitic sore has been shown to be transmissible by inoculation, and seems to supersede syphilis, no secondary symptoms manifesting themselves. The authorities for this statement are Mr. Lane's lectures and two cases reported by Dr. White in the *Medical News* for February 25th, 1882; the theory being that sometimes pus accidentally acquires intensely irritant and destructive properties of which the chancroid is only a milder manifestation. Ricord and Fournier have both noticed that phagedæna is not followed by secondary symptoms, and we presume most hospital surgeons have met with cases

confirming the observation. Our own experience has been such that we have long since taken refuge in the conviction that the appearance of secondary symptoms alone enables us to pronounce that a sore is syphilitic. The cases reported by Dr. White would have been regarded by us as virulent and inflamed chancroids, and we should not have anticipated the appearance of any secondary manifestations. A chancre with true specific induration is one thing, a chancroid with inflammatory induration is another, and we have to confess that we are compelled in some cases to wait for the revealing hand of time to make a confident diagnosis, but we have no recollection of a case where, with an open bubo and extended ulceration in the groin, constitutional symptoms have shown themselves.

There is what seems to us a great want of correspondence between the fifth reason of the American editors and their seventh. In the first we are told that extra-genital chancroids are very rare, and that nineteen-twentieths occur upon the glans, yet one of the most cogent arguments advanced in support of the syphilitic origin of chancroids is contained in the latter, where we are told that syphilis has been seen by many competent observers to "follow a sore having all the characteristics of the chancroid from its appearance to its cicatrization. This is said to be especially the case in chancroids at the base of the penis." Now it seems to us that the problem presented to the reader is about as follows: In only one-twentieth of all cases of chancroid is the sore elsewhere than on the glans penis, and allowing one-half of this twentieth to be at the base of the penis, *many* observers have seen true syphilis to follow a chancroid sufficiently often to say that such a result "is especially the case in chancroids at the base of the penis;" when the whole number of cases in this location is not more than $2\frac{1}{2}$ per cent. of chancroids. It is not said that a chancroid at the base of the penis is always followed by constitutional symptoms, but only that such is especially apt to be the case. We cannot but think that the *many* who have seen such cases, and apparently seen them frequently, have, despite their experience and eminence, been deceived, and mistaken chancres for chancroids. Especially are we encouraged in this belief by the fact that dualists can explain such cases by the theory of two viruses, which theory, hypothetical though it may be, seems to us the more rational one, and has had the support of too many accomplished observers to be thrown over without more convincing proof than has been advanced by Drs. White and Simes. M. Cornil finds no difficulty in believing in mixed sores, and points out that it is very easy for a person with an infecting chancre, which causes little pain, to have connection with a woman with chancroids, and to have in consequence both viruses active at the same time.

Some of the dualistic arguments are presented by Drs. Simes and White, who, while showing a very distinct bias, expressly state that they do not presume "to decide a question upon which so many eminent authorities differ." The whole matter is judiciously summed up in the following words of Mr. Lane, of London.

"It is unsafe to predict confidently that any venereal ulcer, even a soft sore attended with suppurating bubo, will entail no further consequences. There is a strong probability that an indurated sore will prove infecting, and there is a probability, though not nearly so strong, that a soft suppurating sore will not, but exceptions to both these general rules will be met with, and there is really no absolute proof of the infecting nature of any given sore, but the fact of infection itself."

We would call especial attention to the admirable and very full consideration bestowed upon the diagnosis of chancre by the American editors, in an addition of some ten pages, based in part upon the paper of Ch. Mauriac. We have not space to do more than express our high appreciation of the value of this addition and of the parallel tables contained in it, by which the distinctive differences existing between venereal and other sores are contrasted.

When we come to the treatment of venereal sores Drs. White and Simes inform us that they now find it unnecessary to cauterize all chancroids, but treat them in the manner advised by Greenough, of Boston, as they would any non-specific ulcerations, and think the duration of the sore is materially diminished thereby. When, however, the ulcer manifests a disposition to extend, or when there is no inclination to heal, our authors apply fuming nitric acid, or bromine, with the object of establishing a layer of plastic material around the sore, which acts both as a barrier against further extension, and by providing a new and sound material for granulations to build upon. Whether the success of this mode of treatment is owing to the non-specific character of chancroids, or, as Dr. White suggests, to the modification in the virulence of chancroidal virus of late years, we are assured that the treatment has proved most satisfactory during the five years he has practised it. It is noticeable that while expressly disclaiming any preference for iodoform on account of its alterative action, it has been the standard application made, and we should have more abounding confidence in the general-principle treatment of chancroids had resin cerate or oxide of zinc ointment been chiefly relied upon.

The less local treatment infecting chancres receive the better as a general thing, but Dr. White's experience, as already said, inclines him to think that the practice of Auspitz and Unna is worthy of imitation, and he advises the excision of the sore, whenever it presents itself sufficiently early, and is favourably located. Indeed, Dr. White is much less reserved in commending this proceeding than he is when speaking of the theory of syphilitic contagion. In the majority of cases in which he has excised the chancre, some fifteen or twenty in number, syphilis has indeed followed, but in a few cases it seems probable that constitutional disease has been prevented. Knowing that this kind of proof will be met by suspicions of the correctness of his diagnosis, he does not give the cases in detail, but he expresses himself as being thoroughly convinced by them. Indeed, in two cases he has been able by confrontation to prove the accuracy of his diagnosis, the women, upon examination, being found to have mucous patches, while his patients have escaped secondary symptoms, for which the proper period had long since passed at the time this book was published. When the induration is deep, or the sore is so situated as to forbid excision, active cauterization may be resorted to, but with much less prospect of a successful issue. Dr. White has very large opportunities for observation, his thoroughness and painstaking accuracy are of a high order, and his experience has been so satisfactory to himself, that we hope others will be induced to give the plan a fair trial. It is an insignificant operation in itself, and can do no harm. Should the adoption of this method of Auspitz and Unna only save a minority from constitutional infection, the benefit would be very great, while in those where no such favourable result ensued there would be no injury sustained if mercurial treatment were not instituted until the appearance of secondary symptoms.

In Chapter IV. the lymphatic manifestations of syphilis and the chancroid are considered. Cornil says, "almost at the same time that the chancre becomes indurated the lymphatic glands connected with it, by means of the lymphatic vessels, become hypertrophied," and it is this indolent engorgement of the lymphatics which furnishes one of the most certain evidences that a given sore which they attend is syphilitic. Yet the chancroid also has its bubo, and indeed it is the one to be most dreaded. In syphilis many glands are involved, forming a chain, in chancroid a single gland only is generally concerned, but the process going on in that one is active, tending to suppuration, and very prone to form a deep and extensive ulceration, with all the peculiarities residing in it which belong to the chancroid. Mere syphilitic glandular engorgement requires no special treatment beyond that which is aimed at the general system, but chancroidal buboes urgently require vigorous local treatment of which no mention is made by either Cornil or his editors, and concerning which it would therefore be out of place for us to express the very decided opinions we entertain. Inasmuch as the chancroidal bubo is described by Drs. Simes and White, we regret that they have not seen fit to give us their views as to the proper method of treating it.

Although we have gone over but a small portion of this volume the growing length of this review warns us to hasten it to a conclusion. We therefore pass over many chapters, only saying that the various manifestations of secondary syphilis in the different tissues of the body are gone into with a thoroughness which makes the book almost an encyclopædia of syphilitic pathology—until we come to the concluding one which has to do directly with the treatment of syphilis.

M. Cornil is a mercurialist of course, as it seems to us must be every one who has any experience in the treatment of syphilis, but he belongs to the more moderate class. He gives moderately large doses, generally of the protiodide $\frac{3}{4}$ to 1 grain, and discontinues the remedy immediately upon the cessation of the symptoms. In the deep cutaneous syphilides, which mark the passage from the secondary to the tertiary stage, he combines iodide of potassium with the mercurial. Inunction with mercurial ointment is recommended by M. Cornil when the manifestations are particularly stubborn, but he warns his readers to carefully watch against sudden salivation, which follow the rapid absorption of the ointment. Of subcutaneous injections he speaks approvingly, although he does not speak of practising it himself, thinking that by this method "a certain determined dose can most readily be made to enter the system, and which causes the most immediate modifications in the syphilides." With an emphatic and almost enthusiastic laudation of iodide of potassium, M. Cornil brings his book to a close. There remains a most valuable, tersely written, clear, and definite addition by the American editors. Without denying the tendency of syphilis to recovery, they maintain that it is an established fact, that the careful administration of mercury will increase the probability of cure, and shorten the duration of the active stage. They also favour a continuous rather than an intermittent administration of the drug. Among the theories advanced to account for the undoubted efficacy of mercury in the treatment of syphilis, they prefer the one which attributes that efficacy to its power of promoting distinctive metamorphosis and fatty degeneration exerted against the degraded but rapidly multiplying cells, which in common with Dr. Otis they regard as the underlying cause of syphilis. They think that the undoubted beneficial effects observed by Keyes and

others, to follow the long-continued use of small doses of mercury are better explained by the stimulating effect of that drug upon the lymphatics, thereby leading to improved nutrition and the removal of plastic exudations, rather than by any true tonic property. We have already pointed out the effects which Drs. White and Simes attribute to the degraded cells which are demonstrable in syphilis, and whether they are carriers of an impalpable virus, or some as yet undiscovered germs, those gentlemen think that mercury attacks those cells, hastens their further degeneration, and favours their absorption by the lymphatics stimulated into activity. Inasmuch as it is a well-known fact that newly formed tissues are possessed of less resisting power than the normal structures, only small doses of mercury are needed, and of the efficacy of such our authors very properly think there is abundant clinical proof. They do not think that this theory of Dr. Otis is free from difficulties, but they think fewer attach to it than to any other, and that it is worthy of favourable consideration, as based upon known physiological laws, and as dispensing with vague assertions as to specific, antidotal, and other influences.

The rules of treatment laid down by Drs. Simes and White are substantially as follows: 1. Do not give a mercurial until secondary symptoms appear, as without those symptoms there is no absolute certainty that syphilis is present. 2. When they do appear give protiodide of mercury $\frac{1}{4}$ to $\frac{1}{3}$ of a grain, three or four times daily, adding opium if the bowels are disturbed, and prescribe a chlorate of potassium mouth wash as a prophylactic against salivation. 3. Ascertain the proper dose by Keyes's method, which consists in administering the remedy until the mouth is touched, then give just half the quantity; and 4, continue that treatment for eighteen months. 5. Increase the dose with the appearance of new symptoms, and return to the standard upon their subsidence. 6. Use such mild local treatment as may be required. 7. At the end of eighteen months combine iodide of potassium with the mercurial, which should preferably be the bichloride, and continue the mixed treatment for six months longer. 8. At the end of two years discontinue treatment, unless there are positive indications for it, but keep the patient under observation for another year, at the end of which time, should no further manifestations appear, the case may be regarded as cured.

Our estimate of the value of this book is sufficiently evidenced by the length at which we have written upon it, and we have no hesitation in again saying, that it is entitled to take a high rank. It is very noticeable that M. Cornil is almost entirely unacquainted with the labours of English and American surgeons in the same field, but his editors have very fully made up that deficiency. Indeed, these gentlemen are worthy of the highest praise for the manner in which they have done their work. Possessed of unusually facile pens, they have brought the work up to the very latest date, and it would appear as if nothing of importance had escaped them. We have ventured to differ from some of their conclusions, but we have desired to do so modestly, and are fully alive to the fact, that there are yet many things undetermined even in so well studied a subject as syphilis. The interpolation of so many large and important additions is somewhat awkward, and there is some lack of regular arrangement apparent, which, occasionally, leads to repetition, and which would seem to be unavoidable from a book so constructed. S. A.

ART. XV.—*Who Invented the Obstetrical Forceps? Was the Instrument in use before the time of the Chamberlens?*

"*The Chamberlens and the Midwifery Forceps, Memorials of the Family and an Essay on the Invention of the Instrument,*" by J. H. AVELING, M.D., F.S.A. 8vo. pp. 230. London: J. & A. Churchill, 1882.

THE volume under review, is the result of ten years of earnest search on the part of its author, who has evidently spared no pains to make his work thorough and complete. We can fully appreciate such labour, and have no doubt, that aside from its tediousness, it at times afforded Dr. Aveling much real pleasure, especially when he unravelled the mystery of the three Peters and two Hughs, and discovered who was *the Peter* that invented the forceps, and that he was not the Peter to whom the honour has generally been awarded. The Chamberlens, in whose family the secret of the fenestrated and adjustable obstetrical forceps was kept for four generations, consisted of seven "men-midwives," viz.: Peter I., Peter II., Peter III., Hugh I., Paul, John, and Hugh II., to whom the exclusive use of the instrument was a mine of wealth. We propose to give a *résumé* of the work under review, so as to present the leading points of interest in the lives of these seven men, the descendants of William Chambrelein,[1] and their connection with the use of the instrument in their practice of obstetrics, and to examine the historical claims setting forth its much earlier existence.

1. *William "Chambrelein,"* the progenitor of the family in England, was a Huguenot, who with his wife Genevieve and three children, Pierre, Simon, and Jeanne, left Paris in the year 1569, to escape the persecutions under Charles IX., and sailed over from France to England, landing at Southampton, where his name is found recorded under date of July 3d of that year, in the register of the church of St. Julian. A fourth child, Jacques, was born soon after their arrival; and in 1572 a fifth, also a son, who, strange to say, and to the confusion of his subsequent history, was named Peter,[2] whom we shall call Peter II., preferring the numeral distinction for its simplicity. William Chambrelein is presumed from some remarks made by his descendants to have practised medicine, although there does not appear to be any positive evidence on this point. As he was mentioned in 1596 as *the late William*, he died prior to that period.

2. *Peter I.*, or the elder Peter, of William's two sons of the same name, was, as has been stated, born in France, and went to England when a little boy. In one sense he was the Peter the Great of the family, as he is "the uncle" referred to by Smellie as the inventor of the forceps, although overshadowed by the higher position, and greater reputation of Peter III., son of Peter II. his younger brother. Peter I. was not educated as an M.D., but became one of the order of Barber Surgeons, who were not permitted to prescribe medicines under penalty of fine and imprisonment, the violation of which law got him into trouble, and sent

[1] There is reason to believe that the original name of the family was *Chambrelan*, spelled as above, in the old French, and not Chambellan (in English Chamberlain). We find no less than eleven terminals to the name in history, viz.: *brelein*, *brelan*, *brelen*, *bellan*, *berlaine*, *berlayne*, *berlane*, *berlan*, *berlin*, *berlyn*, and *berlen*. The last was adopted by Peter III., and continued by his descendants.

[2] We know of three families in Philadelphia, having each two brothers of the same name, distinguished only by their middle initials.

him on one occasion for a short time to Newgate. Midwifery was regarded as a surgical work, although requiring a separate license, and the title of "Surgeon and Man-midwife" was a common, but a much less honourable one, than that of Doctor. Peter I. was enrolled as a Barber Surgeon prior to 1598, and appears to have soon acquired a good practice. He seems not to have been able to resist the temptation to prescribe, and was frequently under accusation for doing so. He was known in the profession as "Petrus Chamberlaine Senior," and resided in Mark Lane, London, having removed from Southampton between 1588 and 1596. In 1614 he is recorded as Surgeon to the Queen (Anne), who presented him with a diamond ring; he was also surgeon to Henrietta Maria, wife of Charles I., and attended her in labour in 1628. He died in December, 1631, having resided in England 62 years, and was probably over 70.

3. *Peter II.* or "the younger" was also, as stated, the son of William, and was born on February 8, 1572. Like Peter I. he became a Barber Surgeon, and is presumed to have been admitted to the Company about 1596. He became also a man-midwife, receiving his license from the Bishop of London. Like his elder brother, he was frequently in trouble with the College of Physicians for having administered medicines to his patients, and was fined for so doing. The two brothers were largely dependent for practice upon the midwives of London, who called them in to deliver difficult cases, and with a view to an increased advantage, endeavoured to have them incorporated and made a society, with arrangements for instruction in anatomy and other branches. Peter II. had eight children, the eldest of whom was Peter III., known for distinction as "Dr. Peter," being an M.D. Peter II. died in August, 1626, at the age of 54, five years earlier than his elder brother.

4. *Peter III.*, known usually as "Dr. Peter Chamberlen," was the son of Peter II., and nephew of Peter I., and was born on May 8, 1601. Of the three Peters he is the best known in history, and his likeness has been preserved in an engraving executed in 1658, at the age of 57, and erroneously marked "Paul Chamberlin, M.D." who was at that date a young man of 23. Peter III. had the advantages of a collegiate education at Oxford and Heidelberg, and studied medicine at Padua, graduating at the age of 18. He continued his medical course subsequently at Oxford in 1620, and Cambridge in 1621, and became a Fellow of the College of Physicians of London in 1628, by which time he had already acquired a reputation as a medical practitioner at home and on the Continent. When thirty years of age, he was alone in the secret of the forceps, his father and uncle having died. His reputation became so extended that the Czar of Russia wrote to Charles I., offering to take him into his service, but the doctor declined. He became in the course of his life, Physician Extraordinary to King James and Queen Anne, Charles I. and Queen Mary, Charles II. and Queen Katherine, and to some foreign Princes. Like Peter II., his father, and Peter I., his uncle, he made a futile attempt to incorporate the midwives of London (in 1634), desiring to make use of them for his own advancement and gain, and to be appointed a governor over them. This scheme was resisted on the part of the midwives and the petition was denied him, it being claimed that he had tried through them to monopolize the work of delivery in their difficult cases, and that he was in the habit of making bargains, with unreasonable demands for large fees, before he would undertake to deliver the suffering patient; in fact it was even claimed against him, that parties

had perished for want of help whilst he was bargaining for a high reward, and this especially among the poor, who found it difficult to meet his unreasonable demands. These charges brought from his pen, in 1647, a defence entitled, "*A voice in Rhama; or the crie of women and children, echoed forth in the compassions of Peter Chamberlen, Doctour in Physick, Fellow of the Colledge of London, and one of his Majesties Physicians Extraordinary*," in which he sets forth his claims to superiority as a man-midwife on account of the possession of a secret process of delivery, and denies that he was in the habit of charging as had been claimed to his discredit. The following extracts will be found of interest to the profession.

After recounting his own early history and educational advantages, he says:—

"Then fame begot me envie and secret enemies, which mightily increased, when *my father added to me the knowledge of deliveries and cures of women.*" In his defence against the claim of exaction he says: "I seldom bargained beforehand, or not above twentie times when exceedingly animated by some fresh injuries and grosse abuses; although I hold not bargains unlawful, so long as the labourer is worthy of his hire." . . "I never arrested any for what was due, whether by bargain, promise, or otherwise; although in all abused. I never demanded the full value of the operation, if equally compared with other matters of price, or other great operations of Chyrurgery." . . "That operation merits £100 as well as other cures or operations, according to the value of lives and estates. Yet for one who hath paid me £10, I have delivered 100 for nothing, and as many for lesse than nothing; such as thought it a point of wisdom to save their purse and pay me with lies and scandals, insufferable scandals, and so frequent till they caused me abhor the work itself." . . "To prevent both discontent on the one side and dishonestie on the other, I resolve (as others use to do, and as they have hitherto falsly reported of me) to afford my labours to none but such as trust me with their money before I trust them with my art, which I shall afford at £10 to any that are reputed worth £1000, and in lesser proportion to such as shall bring with them the testimonie of their Minister and Neighbours of their meaner condition: and if the certificat rank them among the poor, I shall as freely as ever give them assistance. But if any (except kindred, friends, patients, or Ministers) addresse themselves unto me without former conditions, let them not think it strange if I turn my former affabilities into future denyals, and that I lay my self lesse open to affronts in that kind than formerly." "The Draper is not bound to find cloth for all the naked, because he has enough in his shop, nor yet to afford it at the buyer's price. The Lawyer is not obliged to spend his voice and spirits for all the injured in *forma pauperis*, because he pleads well, and shall be heard. Acts of charitie are more due from kindred than from strangers. When a husband of sufficient means shall not think his wife's or child's life worth £10, I am not bound to bestow that on them which is of more value." . . "In summe, I am wholly tired out with the injuries, vexations, and losses of the businesse."

Failing in his endeavours to obtain an act incorporating the midwives of London, either under the direction of himself or entirely independent of him, he next turned his attention to the establishment of public and private baths, and the obtaining of an ordinance giving him the exclusive right of making baths and bath-stoves for fourteen years. This ordinance passed the House of Lords in 1649, but was rejected by the House of Commons, after it had been submitted to the College of Physicians and returned with its disapproval. This act created a great deal of discussion, *pro* and *con*, and finally resulted in such a condition of opposition between Dr. Chamberlen and the college that he was at length dismissed from his fellowship, "for repeated acts of contumacy," by a vote of the body, on November 23, 1649.

We next find the Doctor engaged in advocating some wild Utopian ideas for the benefit of his country and its people, and in writing numerous religious papers setting forth his peculiar and changing views upon theological questions. These he disseminated in pamphlet form, and thereby rendered himself unpopular in the community, provoking his opponents to the production of many caustic and ridiculing answers, which have been preserved as curiosities of the times in which he lived. He was also given to disputing in public, and earned the reputation of being a fanatic, if not bordering upon lunacy.

In February, 1661, Dr. Chamberlen received the appointment of Physician-in-Ordinary to King Charles II. In 1665–66 he was busily engaged in endeavouring to secure patents in several countries, giving out that he had a plan by which vessels could be propelled within two points of the wind, if not made to sail full against the wind. He applied through his son Hugh, as he was then in Holland, for a patent from his own country, and received an answer to the effect that, when he demonstrated the possibility of his plan, his petition would be granted. Strange as it may appear, he succeeded in obtaining patents for his "*invention of navigating with all winds, in a straight line*," from France, Venice, and the United Netherlands, without demonstrating the practicability of his idea. Failing through his son, he returned to England and advocated his case in person; and although he positively, as before, declined to exhibit the *sine quâ non*, the government granted him the patent for the time asked, and subsequently enlarged it so as to include the manufacture of coaches, wagons, carts, and ploughs, to be driven by the wind. This whole crazy project, as might be expected, failed; for, although the King and Parliament were willing to let him build the ships, the dupes to aid him with the requisite funds could not be obtained. The reviewer has seen the inception of insanity exhibit itself in a physician, now long resident in an asylum, in a somewhat parallel project, by which he anticipated being able to realize a million of dollars. Dr. Peter Chamberlen appears to have had insane freaks, and then to have recovered from them, although at all times more or less eccentric in his ideas. Had he been of stable intellect, his next project might have been made a success, as it has been since by Isaac Pitman; for he conceived the idea of writing by sound, and obtained a patent on Nov. 8, 1672, for "his new invention of writing and printing true English, whereby better to represent to the eye what the sound doth to the ear, than what is now practised." This, like others of his schemes, seems to have ended in its conception; how he was to carry out the idea by the pen or type remains a mystery.

Dr. Aveling reproduces in his work many of the singular writings of this peculiar, if not at times insane, author, which are curiosities of thought and composition, and reveal the character of the man, and his singular ideas upon religion, political economy, etc. etc. He died on December 22, 1683, at Woodham Mortimer Hall, near Malden, in Essex, England, at the age of 82 years.

This Woodham Mortimer Hall is presented by the author as the frontispiece of his book, and deserves a special notice, as it is intimately connected with the discovery and subsequent revelation of the character of the instruments used by the Chamberlens in their obstetric practice. This residence remained in the possession of the descendants of Peter III. for thirty-two years after his death, or until 1715, and the secret closet containing his instruments was not discovered until almost a century after it was sold by his son Hope, or until 1813, of which more hereafter.

Peter Chamberlen III. was twice married, and had fourteen sons and four daughters, forty-five grandchildren, and eight great-grandchildren; of whom three sons, Hugh, Paul, and John, two daughters, twenty grandchildren, and six great-grandchildren survived him. Hugh, Paul, and John were all obstetricians at the time of their father's death, and the first two were then respectively (about) 53 and 48 years old; John was a little younger.

5. *Hugh Chamberlen I.* was, as stated, the son of Peter III., and, being his first child, is computed to have been born about the year 1630. Although designated by the title of Doctor, no evidence has been discovered of his having received the degree of M.D., and, in fact, little is known of his doings until when he must have attained the age of thirty. He was married on May 28, 1663, and had three sons and a daughter, the eldest son of his own name succeeding him as heir to his secret.

The great obstetrical event of Hugh Chamberlen senior's life was his attempt to deliver a woman in Paris having a deformed pelvis, on August 19, 1670. This woman was a dwarf of 38, who had been in labour eight days, and her waters had been broken a week. Mauriceau, who had her in charge, did not wish to perform the Cæsarean operation, believing that it would be certainly fatal, and hearing of Hugh Chamberlen being in Paris, and knowing of the claims of this family of accoucheurs, invited him to see the case. Hugh expressed surprise that Mauriceau, whom he characterized as the most skilful obstetrician of Paris, was not able to deliver the patient, and promised to do so in "half a quarter of an hour." After labouring more than three hours, only stopping to take breath, he abandoned the case. The woman died in twenty-four hours, and an autopsy showed that the uterus was torn and pierced in several places by his instruments. Chamberlen, according to Mauriceau, had then been six months in Paris, having gone there in the hope of making his fortune, and had proposed to sell his secret mode of delivery for 10,000 crowns. Disgusted with his defeat, he returned in a few days to London, taking with him a copy of Mauriceau's Midwifery, which he translated and published in 1672, and the preface of which he evidently designed as an advertisement of his special ability to deliver without hooks, so as to preserve fœtal life in difficult cases.

In 1673, Hugh, at the request of his father, was associated with him as Physician-in-Ordinary to King Charles I., and in September, 1861, he received the honour of knighthood. He was admitted a Fellow to the Royal Society in 1685. In a little manual, which he published this same year, his name appears as "Hugh Chamberlain," with no M. D. to it. In 1688, suit for malpractice, in the excessive use of emetics, purgatives, and the lancet, in the case of a pregnant woman, was brought against him before the College of Physicians, and he was fined £10.

For nearly ten years of his life Hugh Chamberlen's attention was given to a project for establishing a Land Bank, *i. e.*, a bank to advance money on the security of landed property, and much of his time was taken up in advocating it by pen and tongue. As first proposed, it was a wild scheme for issuing a superabundant paper currency upon a fractional basis of security; but, as finally granted by Parliament, the bank was less objectionable. In 1699 the whole affair collapsed for want of funds, and Chamberlen retired to Holland, according to one statement, but most likely to Scotland, for from 1700 to 1702 he was advocating the advantages of its union with England, and published a volume on the subject. Where he died and

when, have not been ascertained. He practised his profession for some years in Amsterdam, sold his secret to Roonhuysen, who sold it again to others, and thus it gradually became known in Holland, among those who were willing to pay for the information.

6. *Dr. Paul Chamberlen* was the second son of Peter III., and was born on October 22, 1635. The incidents of his early life are unknown, and where he graduated in medicine has not been ascertained; he was a man-midwife, and used the forceps, and was the inventor of the "anodyne necklace," recommended to be worn by teething children and by women in labour for the diminution of suffering. Paul was, in fact, a complete charlatan, and died probably in 1717, as his will was proved by his widow on December 19th of that year. He left a son of his own name.

7. *Dr. John Chamberlen* was the fourth son of Peter Chamberlen III., and, like his brothers and father, practised midwifery, and possessed the family secret. He is believed to have been an M.D., but where he received his diploma is unknown. He died probably at the close of 1699, as his will was proved by his widow on January 6, 1700.

8. *Hugh Chamberlen II.* was the eldest son of Hugh Chamberlen I., and was born in 1664. He took his degree of A.M. in Trinity College, Cambridge, in 1683, and graduated in medicine on October 8, 1689. On April 2d, 1694, he was admitted a Fellow of the College of Physicians, London, and was subsequently elected a Censor in 1707, 1719, and 1721; but his health failing, he was obliged to resign the position in 1722. He died of gout in the stomach on June 22, 1728, at the age of 64, having long been an invalid.

Dr. Hugh II. lived in a fashionable street in London, was a gentleman in his instincts and habits; married into influential families, having had three wives, and practised among the higher classes, chief of which was the family of John Sheffield, Duke of Buckingham, who with his Duchess held him in high esteem, so much so that he spent his last days at Buckingham House, was buried from it, and the Duke erected to his memory, in Westminster Abbey, a handsome cenotaph, upon which is inscribed a long eulogium setting forth his talents and virtues, prepared by another warm friend and admirer, Bishop Atterbury, of Rochester. The Doctor had three daughters, two of whom became heads of families of influence, but no sons. Of all the noted members of the Chamberlen succession, he led the most quiet, refined, and uneventful life, being neither a polemic, a noisy philanthropist, a fanatic, or a lunatic. He seems to have enjoyed a reputation as a kind and skilful physician, being particularly commended for his management of obstetric cases, the diseases of children, and the maladies of delicate subjects. He was the last of the Chamberlens to enjoy the exclusive use of the family secret.

How did the secret of the forceps finally become known? This is a question of much scientific interest, but one which the reviewer after a very careful research, can only answer in a measure. After the signal failure of Hugh Chamberlen I. at Paris, in 1670, already mentioned, and that of his Land Bank in 1699, he settled in Amsterdam, after having been in Scotland, where as stated he published in 1700 and 1702 political papers. The sale of the secret of his forceps to Roonhuysen is generally dated at 1688, which is probably an error, as he was then in England, and for a long time afterward, fully engrossed with practice, and advocating the formation of his Land Bank. After he parted with his secret to relieve his necessities, it was sold and resold as such among the Hollan-

ders for many years. The first revelation of the plan of delivery openly made for the benefit of science and humanity was that of Prof. Palfyn, of Ghent, who being in Paris in 1721, to publish his work on anatomy, exhibited before the Royal Academy of Sciences an arrangement of parallel round-handled non-fenestrated vectes, there amusingly denominated, "*the hands of Palfyn.*" The Professor was evidently not fully in the secret; he had obtained the idea, possibly from a midwife,[1] but not having seen the instrument, did not know of the fenestræ, and how to make the blades independent and antagonistic at will; so he bound the handles together, after having introduced the blades separately. Although the idea then became known in France, the real secret was evidently not in the exclusive keeping of the Chamberlens in England at the date given. *The first publication in England which gave pictures of the forceps* was the posthumous work of Mr. William Giffard, surgeon and man-midwife of London, published in 1734, by Mr. Edward Hody. In this work on midwifery, is the report of a case in which he used his "*extractors*" in 1726. To Mr. Edmund Chapman, of South Halstead, Essex, is generally awarded the priority, but his little book of 1733 contains no illustrations, these having been supplied in the second and larger edition of 1735, after the appearance of Giffard's Midwifery, and the paper of Butler, referred to in foot-note No. 1, who condemned him for not having done so. To Chapman, however, is due the credit of having mentioned the kind of instrument which constituted the secret of the Chamberlens, before any one had *openly* published it. In his book of 1733, we find the following: "there are several different sorts of forceps," . . . "all far from being equally proper; and great regard is to be had to their form." . . . "The secret intimated by Dr. Chamberlen" (Hugh I.), "by which his father, two brothers and himself, saved such children as presented with the head, but could not be born with natural pains, was, as is generally believed, if not past all dispute, the use of the forceps, *now well known to all the principal men of the profession, both in town and country.*" Chapman must even then (1733) have somehow been long in the secret, as he says: "For *many years* my forceps happened to be made of so soft a metal as to bend or give way, or suffer some alteration in their curve. They were made as usual with the screw fixed to one part or side of them. These I used *for some years*, but they often happening to slip off sideways, as before mentioned, my opinion of the instrument was so much lessened, that for *many years* after, I used it but seldom, and even *not once for the space of ten years.*" Put all these expressions of time together, and Mr. Chapman must have used the forceps long before the date (1726) given in the case of Mr. Giffard, of London. William Sermon, in his "English Midwife," 1671, in speaking of the delivery of the fœtus after its death, mentions as extractors, "the crotchet, hooks, *tongs*, and other instruments." Query, what did he mean by the term "*tongs*"? Some have supposed that from this, he may have known of the forceps; but there were instruments then in use for the purpose mentioned, that were quite as well entitled to this name, as the forceps. Had he been at that time in the secret, he would, in all probability, have made capital out of it, in writing his manual for midwives, as it was considered quite legitimate in his day to take every advantage of a discovery, and every physician "was said to have his secret."

[1] The *tire tête*, as Palfyn called his instrument, was afterward claimed as his own by Le Doux, a surgeon of Ypres. It was not known to the world generally until published by Butler in the Edinburgh Med. Essays and Observations for 1733.

Another claimant for the early use of the forceps in England is found in Mr. Drinkwater, surgeon and man-midwife of Brentford, who commenced practice in 1668, and died in 1728, and who left a pair of forceps which came into the possession of Dr. R. W. Johnson, who mentions it in his Midwifery, published in 1769. The instrument resembled those of Chapman and Giffard, except that the hooks of the handles were bent outward, as in those of the present day. As Mr. Drinkwater was an octogenarian when he died, it is probable that he had been in the secret for some years. Among the many Chamberlens, it appears that it was impossible to keep the secret a purely family one beyond a certain period. When the last of the Peters died, and his three sons held the secret, there must have been a leak somewhere. Possibly death may have given up a pair of forceps, as in the Drinkwater case.

The Discovery of the Chamberlen Instruments at Woodham Mortimer Hall, in 1813.—This has often been described, since Mr. Cansardine presented them to the Royal Medical and Chirurgical Society of London, in 1818, but the account given by Dr. May in 1861, and repeated in Dr. Aveling's book, is the most complete. It appears that in 1813, the house was in the care of Mr. Codd, who, with his wife and her mother, Mrs. Kemball, resided there, the last being on a visit. Mrs. Kemball was in a closet over the entrance porch, and noticing the appearance of a cork or small disk of wood inserted in the floor, and again a second one at a distance, investigated their use, and found them to be covers for screw-heads. This led to the discovery of a trap-door with small sunken hinges, upon the opening of which a cavity between the floor and ceiling was revealed, containing among other articles of the Chamberlens their obstetric instruments, consisting of four pairs of forceps of different patterns, three vectes, three crotchets, and three fillets, formed chiefly of whalebone. Dr. Aveling very naturally concludes that these belonged to the three Peters Chamberlen, the instruments of Dr. Peter's father and uncle having been hidden with his own, during his lifetime or later, to secure the keeping of the secret. To account for there having been four pairs of forceps, he remarks that one was so rudely constructed "as to be scarcely practically useful." A testament found, bore in writing the date of 1695.

As an evidence that Peter III. was not the inventor, Dr. Aveling remarks: "He was gay and extravagant in his early professional life, and had not the keen incentives of hardship and want to sharpen his intellect and whet his invention. Besides, we have evidence that he was very early in life in possession of the secret which gave him a superior position as an obstetrician. The midwives, in their petition against his scheme for incorporating them—an attempt which he made in imitation of his father—spoke of him as being a young man." He was then 33. An anonymous writer at this period said: "His father, for aught I ever heard, was a good honest barber-surgeon, and by his knack in midwifery got plentiful estate, which with *his art he left to this young gentleman.*" By the time he was thirty-three he had first secured a good practice, then lost much of it, besides wasting a large portion of his patrimony. Another evidence that the invention long preceded his day is found in the fact that when his father in 1616, at which date he, the son, was but a boy of 15, appeared before the College of Physicians of London to advocate the passage of the act for incorporating the midwives of the city, the petition for the same having been referred to the College by the King and

Parliament; he, the father, gave offence to that learned body by presuming to claim that *he and his brother* (who were only barber-surgeons), *and none others, excelled in the management of difficult cases of labour*, and he was asked whether, in spite of his boast, "any member of the College would not answer and judge more correctly than any obstetric surgeon whatever."

It is evident that Peter II., who was then 44, must have relied upon some secret advantage known only to himself and Peter I. for this claimed superiority as accoucheurs, or he would not thus have risked their future success in practice, by exciting the ire and jealousy of the Royal College. The fact that he was able at 54 to leave houses and landed property to his heirs shows that he was also able from some cause to secure obstetric practice in spite of the disadvantages under which he must have laboured from professional opposition. It might here be supposed that Peter II. was the inventor of the forceps, and imparted the secret to his elder brother, Peter I., but for the fact already mentioned, that Smellie, who wrote in 1752, gave the credit to the uncle of Peter III., which was of course Peter I., known as "Petrus Senior." The true inventor was then Pierre Chambrelan, who was born in Paris somewhere about the year 1560.

It seems almost incredible at this day that the secret could have been kept for so many years; but it will be noticed by the readers of Dr. Aveling's book that no hint is given by any of the family that they used an instrument, or even ventured to call it by name. Had they ever spoken of *the forceps*, it is not likely that its peculiarity of form and articulation could long have been kept in the family as their exclusive advantage. No doubt the chief point in the invention was but the thought of a moment, after which the instrument might have been brought to much greater perfection but for the fact that the desire for secrecy made it imperative that the mechanical work should be done at home. The grand secret was the means of introducing the blades separately, and then uniting them across each other for action. Had the idea of separate introduction once for a moment entered the mind of Rüeffe in 1554, he would have invented the forceps by changing his own fixed instrument into one of independent blades.

The work of Dr. Aveling is a monument of persevering labour. It contains transcripts of wills, documents, and other writings of a curious nature, which are well worth the attention of those who take an interest in antiquarian matters, whether they are in the medical profession or out of it.

Were forceps used in the extraction of living fœtuses before the time of the Chamberlens; and if so, when?

Having carefully examined this subject *de novo*, I am prepared to answer the question in a measure satisfactorily. The claim of priority has been made by obstetrical writers, for three authors, whose cases will be investigated, commencing with the latest, viz.:—

1. In the original edition of the work by Jakob Rüeff, entitled *De Conceptu et Generatione Hominis*, published in Zurich in 1554, we find a wood-cut, representing a pair of forceps, which some have presumed were designed to grasp the fœtal head and deliver a living child. This instrument resembled a pair of lithotomy forceps, and was evidently a craniocast. The blades were riveted together at the joint, were long, slightly curved and hollowed, and devoid of serratures. Such an instrument could

not possibly be introduced, so as to include within its grasp the fœtal head. In fact, Rüeff distinctly states, that it was intended to be used upon the dead fœtus.

2. In the work of Albucassis (Kalaf-Ebn-Abbas-Abu'l-Kasem), are pictures of two pairs of long pincers, having semiannular jaws; one pair armed with teeth, the other plain. The latter has been claimed to have been designed to seize the head of and deliver a living child; but a careful examination of its form, mechanism, and proportions, will show that it could only have been used as a craniotomy forceps. With a fixed joint, such an instrument could never be introduced so as to grasp the head; in fact, Albucassis calls it "a form of crusher for breaking up the head of the fœtus." Abu'l-Kasem was born at Zehera, near Cordova, in Spain, and is said to have practised for part of his life in Arabia. His book was written in Arabic, and contains a large surgical armamentarium, among which are the forceps named. He does not appear to have heard of the form of forceps spoken of by Avicenna, although conversant with the works of many of his predecessors. According to Sprengel's *History of Medicine*, he died A. D. 1122; other historians have dated his death at 1110.

3. In the work of Avicenna (Al-Hassain-Abou-Ali-Ben-Abdallah-Ebn-Sina), surnamed the "Prince of Medicine," we have, however, the evidence that there was a form of forceps designed to deliver the living fœtus. The pattern of this instrument has not been presented, either in the text or an illustration, and we are not informed as to the mode of its introduction; but sufficient, although a very unsatisfactory evidence exists, to show that there was such an extractor in use. Ebn-Sina was born in Arabia, near Bokhara, A. D. 980, and died in 1036 or 1037. He wrote a voluminous work upon general medicine in his native tongue, which was translated into Latin, from which we make the following quotation, which may be found in a number of obstetrical treatises, but without the heading or translation:—

"De regimine ejus cujus partus fit difficilis causa magnitudinis fœtus."

"Oportet[1] ut inveniat obstetrix possibilitatem hujusmodi fœtus, quare subtilietur in extractione ejus paulatim; tunc si valet illud in eo bene est; et si non liget eum cum margine panni et trahat eum subtilitur valde cum quibusdam attractionibus. Quod si illud non confert administrentur forcipes et extrahatur cum eis. Si vero non confert illud, extrahatur cum incisione, secundum quod facile fit, et regatur regimine fœtus mortui."

Of the management of her, whose delivery is made difficult by reason of the greatness of the fœtus.

It behooves that the midwife shall find out (or effect) a possibility of this kind of fœtus, wherefore let it be by little and little (gradually) done finely (finessed) in its extraction; then if that is effective in him, it is well; and, if not, let her tie him with the edge of a cloth (head-band or fillet) and draw him lightly, strongly, with certain drawing together. But if that is not efficient, let forceps be employed (hand to hand) and let him be drawn out with them. If, indeed, that is not efficient, let him be drawn out with incision, after which it is done easily, and let it be managed by the rule of the dead fœtus.

This is a literal rendering of the Latin, which may be expressed in fair English thus:—

[1] Canon Medicinæ, Lib. III. Fen. 21, Tract. 2, cap. 28, p. 932, edition of 1595, in 1 volume; "Junta Avicennæ."

It is necessary for the midwife (there were men-midwives in Arabia then) to discover the possible existence of this kind of (an inordinately large) fœtus; therefore let him (or her) exercise great skill in its gradual delivery; then if this is accomplished, well, and if not, let him (or her) bind it with a fillet and draw carefully and forcibly. If he (or she) does not succeed in this, let the forceps be applied, and let it be delivered by them. If this is not successful, he (or she) must deliver it with an incision, after which it may be done easily; and be governed, as (already explained) in the case of a dead fœtus.

We cannot put upon this paragraph of Avicenna the very liberal construction given to it by Smellie, in the historical introduction of his work upon midwifery. There is nothing in the language to indicate that the fillet is to be thrown around *the head;* the forceps applied to *it;* or *the head* opened and evacuated. *We infer* that the passage treats of a head case, from what the author has already written about, in this section, on midwifery. He has elsewhere treated of presentations of the feet and side, and has given directions for the management of cases having dropsy of the head, chest, and abdomen, and has repeatedly recommended the use of the knife upon the fœtus, for its delivery, when obstructed by its abnormal growth or position. We are to infer then, by negative evidence, that this paragraph treats of the management of the fœtus when presenting by the head, but obstructed in its passage through the pelvis, by reason of its disproportionate size as relating to the latter. The fœtus being of normal form, but too large to be delivered naturally, is to be assisted by the fillet; then by the forceps, if requiring more force; and, lastly, in the event of failure, to have its head *split* open, as already recommended in cases of extremity. What Avicenna wrote upon obstetrics was chiefly a compilation, and the sources from whence he drew, may be readily ascertained; but what he says of the forceps is original, and some have supposed that he contrived the instrument. Be this as it may, we have no evidence that the knowledge of it was ever general in Arabia, or its use long continued. If it ever was employed as the Chamberlens used it, the knowledge of its having been so used, must have died out centuries ago, strange as this may appear. We are disposed to be liberal towards Avicenna in our interpretation of what he has written, but we could wish that he had been so explicit in his language, as to leave no doubt as to his full meaning.

Although we must admit, that in all probability, the Arabians had the ability nearly nine hundred years ago to deliver a fœtus alive, by means of an instrument analogous to the forceps of the Chamberlens, this does not detract from the merit of the member of the family, who restored the lost art, without knowing of its pre-existence. At the present day, the secrecy and monopoly of the use of an instrument so important to human life, would be condemned as devoid of humanity; and the parties keeping the secret would be ostracized as the princes of charlatanry. But in the day of the Chamberlens such conduct was viewed differently, and the discoveries of a physician were regarded as his stock in trade, and were seldom published until age or independence diminished their personal value, or the necessity for concealment. Now everything is changed, and we would regard the seven Chamberlens, if living, as quacks, so long as they kept their process of delivery from the eye of the profession. Paul Chamberlen was for other reasons a charlatan; but all would be, if now living, and keeping their method a secret for the purpose of making

money. Speaking of him, the thought occurs to me, that at the time of his death (1717) the secret was out, and that it must have become known at the time of, or soon after the death of John, in 1700. Possibly at his death, his forceps told the story to Chapman and his brethren, who so mysteriously came into the possession of the secret, and who acknowledged the possession of it, for some years, before they published its true character to the world. R. P. H.

ART. XVI.—*Guy's Hospital Reports.* Edited by H. G. HOWSE, M.D., and FREDERICK TAYLOR, M.D. Third Series, Vol. XXV. 8vo. pp. xviii., 531. London: J. & A. Churchill, 1881.

THE yearly volume of Guy's Reports is ever welcome to the library reading-table. This year's, like its predecessors, comes to us crowded with interesting and instructive materials. We very much miss in the present number many of the older Guy's names, and their absence seems to strike us this year more forcibly than before. In reading the various contributions one cannot fail to notice how strongly the older men have transmitted to their successors the same methods of work, the same mode of thought, as well as the same clearness in expression and teaching. This feature seems to us more noticeable in Guy's Reports than in any of the other London hospitals.

In the first article, which is *On Purpura Hæmorrhagica, accompanying the Growth of Multiple Sarcomata*, Dr. HILTON FAGGE gives the history of six cases, with five autopsies, in all of which multiple new formations were found in various parts of the body; in all of the cases purpuric spots occurred on the surfaces. Dr. Fagge remarks that among the various causes of a purpura attended with hemorrhage from the mucous surfaces there is one which seems to have been left almost unnoticed by writers. It is the rapid development of sarcomatous growths throughout the body generally.

From what he has seen, he says, of the "occasional difficulty of recognizing diffused sarcomatous infiltrations of the bones and periosteum in the dead subject, unless careful search is made for them, I feel some hesitation as to whether such disease may not have been really present in some of the few cases which have been set down, even after an autopsy, as examples of Werlhof's morbus maculosus."

Of the *origin* and *causes* of the development of the morbid conditions nothing satisfactory has been pointed out. In at least three of Dr. Fagge's cases the commencement of the disease was attributed by the patient to a chill or to getting wet through. In a fourth case, a cough was among the earliest of the symptoms, but it was probably due to early tubercular disease at the apex of each lung. In the other two cases no prodromal occurrence is noted. The author remarks, "I know that many pathologists would maintain that a neoplasm cannot possibly have its origin in such a cause (chill or wetting); but, for my own part, I must confess that I am not sure of it."

The duration of these cases is comparatively brief, varying from seven days to a few months, and in some of them the interval from the development of the serious symptoms to the fatal issue is strikingly short.

Of the symptoms, the most striking feature which occurred in all of the cases, was the hemorrhage from the mucous membranes and from the viscera, which, in some, was large in amount, and was attended by immediate severe symptoms; for example, from the bowel and the kidney. But other parts and organs also exhibited similar conditions; the mucous membranes of the mouth and nose, and even the conjunctivæ did not escape. This hemorrhage appeared to be due, in all the cases, to the formations of the new growths taking place on or near the mucous surface or in the tissue of the organs from which the blood was discharged. Its occurrence is, therefore, to be looked upon rather as accidental or mechanical, owing to the position of the new formation, than as a symptomatic feature of the multiple growths, irrespective of their site. In other words, there is no evidence from which to draw the inference that multiple sarcomata or other new growths bring about such blood changes that hemorrhage necessarily results, as we find it in scorbutus and similar conditions.

Another conspicuous symptom, which, however, was present in only some of these cases, requires particular mention, viz., the so-called rheumatism, which was ushered in by more or less severe pains, in some cases quite localized, in others diffuse and general. In one or two cases, other symptoms, such as fever and sweating, contributed to give the conditions a rheumatic aspect, and in one case there was a peculiar smelling perspiration. In none of the cases was there any joint affection, and the *post-mortem* examination showed no alterations of these structures.

From what we know of the nature, course, and seat of these and similar pains, it seems evident that the term *rheumatic* is misapplied to them. Although, in some cases, the preliminary exposure to wet and cold may serve as an explanation, still we think that usually the symptom is caused by the new growth, or the lymphatic glands, which are apt to enlarge in its neighbourhood, pressing on the nerve trunks.

The *post-mortem* examination revealed the new formation in nearly all the internal viscera.

The neoplasm, as seen in the viscera, showed many white or pinkish nodules, sometimes succulent, sometimes juiceless. Some appeared tolerably well defined, while others gradually merged into the texture, as if infiltrating it. In the kidney, the new growth involved the pelvis, and this condition undoubtedly gave rise to the blood in the urine. Where the mesenteric glands were involved, or the omental growths were attached to the intestine, ulceration of the mucous membrane of the gut was found.

The tumours in the skin, in some cases, showed as flat purplish spots; in others, they were raised above the surface, indurated and purplish; and, still others, showed a central pale elevation, surrounded by a narrow area of red or purple skin. On section, "they looked exactly as if they consisted of slightly swollen granular masses of adipose tissue, or were minute lymphatic glands, gray and fleshy." The microscope showed the growths generally to be composed of "a highly nucleated small-cell infiltration" (Goodhart), which, in the skin, had "a curious tendency to infiltrate the small lobules of fat, the adipose vesicles being separated from one another, and inclosed each in a kind of capsule of new growth."

The blood, which, in some of the cases, was examined microscopically prior to death, showed no increase of the white corpuscles or other changes which threw any light on the nature of these cases. *Post mortem*, no

alterations were detected; the only change in appearance that is mentioned is that, in one case, the blood presented a chocolate colour. The medulla of the bones, so far as examined, showed no changes.

The author expresses the opinion that one at least, and perhaps a second, of these cases are instances of Hodgkin's disease, and goes on to say that while purpura, epistaxis, and other hemorrhages occur as complications of that disease, they are not among the earliest and most conspicuous symptoms noted.

"Different views may be taken with regard to the relations between sarcomatous growths and purpura. One is that a minute development of sarcomatous tissue, with vessels made up of embryonic cells, occurs at each spot which becomes the seat of an effusion of blood; or, perhaps, the sarcomatous cells, or nuclei, or even leucocytes in an abnormal condition, become lodged in the capillary vessels here and there, and produce softening of their walls after the manner of emboli."

It is probable that both of these views are correct, or rather that each of the conditions described by the author are representative of two stages, a very early and a late one, of the new formation. The early stage of the neoplasm, represented by the flat, red, or purplish spots without induration on the skin and the ecchymoses on the pleura and pericardium, is actually found to be "the sarcomatous cells, etc., lodged in the capillary vessels" after the manner of emboli.

The author advances another view to account for the purpura, the spongy bleeding gums, the epistaxis, etc., viz., that they are the joint results of a profound cachexia or alteration of the blood similar to that of scurvy, splenic leukæmia, etc. It would seem that in these and similar cases where a multiple outburst of tumour-formations takes place, we are almost driven to accept the view that profound blood alterations do exist. In these cases as well as in others, no definite chemical or microscopic changes in the blood have been described—at least not such as are recognized in scurvy or in leukæmia. We may hold the view that a single tumour, for example a carcinoma of the breast, is the necessary precedent of secondary growths in the liver or other organs, and that the primary source of infection is a necessary one in such cases. The primary tumour is the one from which the cells of the secondary growth are derived. But simultaneous multiple growths stand in the same relation to the normal condition that the primary single growth does. The same force which conditions the perversion of the cells in a solitary growth acts for the multiple growths.

Infection may not be the proper word to use in the case of multiple sarcomata, since it may lead to a misapprehension; but, nevertheless, the idea of a general acting force must be brought into view. In splenic leukæmia and in Hodgkin's disease we see an exhibition of similar acting forces as in this group of cases, and while in Hodgkin's disease it often occurs that a certain group of glands are primarily involved, we do not regard these glands as primary tumours which lead to the secondary growths by metastasis.

The paper is an excellent one, and we thank the author, who, by collecting these cases, has rescued the facts from the oblivion in which they were completely immersed. Unfortunately purpura hæmorrhagica does not furnish us with the groundwork on which to form a pathological entity, and in the cases here furnished the post-mortem appearances of the new growths are not entirely similar and homogeneous. We are there-

fore lacking at both ends of the line in the materials from which to form a new class of disease. Nevertheless, however much we may question the appropriateness of the heading under which these cases are grouped, there is every reason to thank any one who has laboured to bring together instances where purpuric spots and other connected phenomena exist simultaneously with, or are caused by, new growths of whatever character occurring in the skin, and also in the internal organs of the body.

Dr. THOMAS STEVENSON, in a brief paper on *Thermometric Scales*, points out the origin and the respective use of the three principal gradations. He alludes to the general ignorance of the history of these modes of mensuration, and acknowledges his indebtedness in great part to S. F. Gray's "The Operative Chemist," a book of a half century ago, and now rarely met with.

Dr. P. HORROCKS, in an article on *Reflex Action in Diagnosis*, states the factors brought into play in reflex action; he then considers the reflex movements produced by the application of stimuli to the skin and certain mucous membranes, and the changes which result in these reflexes by various diseases. Following this discussion comes the consideration of the muscle and tendon reflexes, which are not, as according to Erb's theory, truly reflex acts. It seems, however, that if these phenomena are not truly reflex, nevertheless that the usual apparatus of so-called reflex action must be in a state of health in order that the phenomena should occur.

The author then gives the necessary conditions for the production of these knee, ankle, elbow, and wrist phenomena, and furnishes a list of diseases in which they are absent or exaggerated. Dr. Gowers has recently proposed the name of myotatic contractions for these phenomena.

The author has collected a large group of facts which are essential to the study of nervous diseases, and has placed them in a convenient order for reference. So little comparatively is yet known of the essential anatomical basis on which the discussion of these questions rests that heretofore much wasted effort has been spent on theorizing on clinical observations quite insufficient for their determination.

In an article *On the Rheumatic Diathesis in Childhood*, Dr. JAMES F. GOODHART briefly discusses the question of diathesis and what it is. He disclaims an intention to define the word or the *something* which it represents, but his idea, in brief, is that it is equivalent to a family strain, as the term is understood among breeders. Diathesis seems, therefore, according to Dr. Goodhart, to be merely an equivalent expression to hereditary transmission. Nevertheless, the statement is made that syphilis, the most readily and certainly transmitted of all diseases, is excluded from the diathetic class chiefly because of its easy acquirement.

The object of the paper, however, is to give the evidence which he has collected during three or four years upon the question of the liabilities incurred by children of rheumatic parentage. First he says "a word on the intensity of the rheumatic strain," and "from a large number of inquiries upon this point, it appears to me that there are few diseases which run more in families than it." This statement, though unquestionably a true one, does not seem to us to have as its essential basis the proof of either the diathetic or hereditary nature of the disease. We have histories of families in which every member was of illegitimate origin, and all had suffered from venereal disease. The facts furnish no evidence of heredity or of diathesis.

The liabilities, under the rheumatic diathesis, are considered in respect to acute rheumatism, heart-disease, chorea, headache, night terrors, crises gastriques, noctural incontinence of urine, etc. "Acute rheumatism in children is in the majority of cases inherited." "Two-thirds (of the cases in children) have rheumatic antecedents of some sort."

The question of heart-disease in children brings us much closer to the heredity and the diathesis in rheumatic affections, and it is probable that the reality of these conditions can be settled by this method only. The author has collected 137 cases of heart-disease in children; of these, 73 had a rheumatic family history, and 19 of the patients had had rheumatic fever. Two-thirds of these nineteen patients would have also a rheumatic family history. In considering whether a mother may transmit to her offspring something which leads to heart-disease, we have to think in the first place what capability she has of altering the heart valves, and under what circumstances endocardial inflammation is produced in her own heart. First, is there any evidence to believe that endocarditis occurs in the mother apart from the more or less acute manifestations of a rheumatic attack? No. To be sure we know of acute rheumatism having as its initial phenomenon endocarditis, but this inflammation is quickly followed by or accompanied with articular symptoms. We do not know of rheumatic cardiac inflammation or chronic valvular changes as the sole manifestation of rheumatism; it is possible for them to occur, but we have no positive knowledge of the conditions. If the mother does not acquire an acute valvular inflammation or chronic valvular thickenings without acute rheumatism, is she more likely to engender such changes in the fœtus in utero than to herself? Again, No.

To answer the latter question in the affirmative requires us to suppose a vastly greater susceptibility of the fœtal tissue to disease than the adult. We have no proof of this, especially not in respect to the fibrous tissue of the cardiac valves. On the other hand, that a mother suffering from acute rheumatism can communicate acute endocarditis to her unborn offspring we can readily believe. And after an acute intra-uterine endocarditis that the cardiac valves should become greatly deformed we can even more readily understand. During fœtal life the tissue of the heart is softer, and when in a state of increased softness from inflammation the force of the blood-current can easily distort and deform the cardiac valvular apparatus, and even its muscular tissue.

It is probable even that most of the cases of congenital malformation of the heart, especially in patients who attain adult life, can receive their explanation by the action of this and similar causes or diseases. Other cases are doubtless due to lack of development of the fœtus from imperfections of the ovum. In these cases, as well as others, to prove their origin unequivocally, it is necessary to make out something more than a diathesis; we must be distinctly cognizant of the actual presence of the diseasing cause, and that this cause acted on the heart during intra-uterine life. We can readily suppose that a child, whose mother had acute rheumatism during her pregnancy, should suffer from acute endocarditis, but not sufficiently or severely enough to leave behind the traces, the valvular murmurs, by which we are able to recognize the past cardiac disease. That the valves of such a heart are especially liable, nay prone to subsequent inflammation, or even chronic thickening during later life, is only what we are perfectly familiar with in many rheumatic adults.

In respect to chorea, the author states that from his cases, eighty-one

in number, the disease in two-thirds of the instances is found with close rheumatic relations, but he does not think it is always rheumatic by any means. The relationship which the paper shows rheumatism to have to other neurotic diseases is most interesting.

The appendix of cases read in connection with the author's remarks, which we have given in brief, are very valuable, and will afford a basis from which the subsequent study of this question may be pursued as it deserves to be.

Dr. P. H. PYE-SMITH, in a paper on *Alopecia Areata*, discusses the different varieties of loss or absence of hair, but especially that indicated by the title.

He states that, on one occasion only, has he found "some spores and scanty mycelium close to one of the neighbouring hairs," but he is thoroughly in accord with most modern dermatologists, that the presence of a parasite is entirely accidental. "Apart from the microscopical evidence, the naked-eye appearances and natural history of the disease would alone disprove the parasitic hypothesis. The hairs around the affected spot are not swollen at the root, nor brittle in the shaft, but are simply atrophied, like normal hairs which are ready to drop off. There is no evidence of local irritation in the hair-sac. The disease, above all, is not contagious, and is not curable by anti-parasitic treatment.

The disease is more common before the age of thirty than after, and affects both sexes equally. It occurs in persons of all conditions of general health, complexion, and temperament. Second attacks are rare after a first attack.

Such, in brief, is the account which the author furnishes of this disease.

On the Fatal Termination of Diabetes, with especial reference to the Death by Coma, is the title of a paper by Dr. FREDERICK TAYLOR, which contains a record of the deaths in Guy's Hospital from diabetes, during eight years, from 1873 to 1880. One hundred and fifty-nine cases of this disease were admitted during this period, of which 43 died. The cause or mode of death in these cases is stated, as follows: Coma, with or without visceral lesions, 26; coma, with renal disease, 3; doubtful cases, 3; various other visceral localizations, principally pulmonary, but no coma, 11.

This summary does not include all the possible causes of death in diabetes, such as fevers, gangrene, apoplexy, malignant disease, etc., but is sufficient in number to indicate that those mentioned are not very common. It shows that the chief causes of death are phthisis, pneumonia, and the train of nervous symptoms usually described as coma. These figures increase very considerably the proportional number of deaths from coma. The proportional increase may result in two ways: first, from this comparatively small number of cases accidentally furnishing a larger number than usual of comatose cases; and, secondly, because this symptom as a cause of death is comparatively a new observation, and, until Kussmaul's description in 1874, almost unnoted. The latter cause acts probably more strongly in increasing the proportion, since we shall find that the older observers of diabetes content themselves with an indefinite description of death by exhaustion, nervous symptoms, and doubtless, also, many put down to apoplexy were cases of suddenly developed coma. Then, too, in many cases of lung diseases, attended at their termination with coma, this symptom, as well as death, has been attributed entirely to the pulmonary lesions, and, doubtless, often without just cause. All of these considerations, if applied to a review of former cases, would increase the proportion of deaths from coma.

The author considers the various theories which have been proposed to account for the outbreak of the symptoms. These may be divided into three groups: *first*, an exhaustion of the nervous centres, coming in the natural course of the disease, or from some accidental occurrence, such as over-exertion; *second*, the accumulation of some effete morbid products, or the formation of new bodies in the blood; *third*, the alteration of the physical conditions of the circulating fluid (blood-thickening).

The second of these theories has received the most attention of late, and it is divided into two branches: first, the development of aceton (acetonæmia); and, second, lipæmia and fatty embolism of the viscera. Of the first substance, aceton, its presence is not, by any means, constant, and when occurring in small quantities is insufficient to produce the symptoms, so that the mere detection of its smell does not warrant the diagnosis of death from acetonæmia, any more than its presence would justify an unfavourable prognosis.

The question of the uræmic nature of this form of coma naturally falls under this group, but there is little to support the view, even if albuminuria existed simultaneously with it, and in connection with a diminution of the excretion of the urine.

In respect to fatty embolism, the milky state of the blood was present in only two of the cases, showing that while such a condition may produce in diabetes coma, or other nervous phenomena, as it does after fracture, still the majority of cases of diabetic coma cannot be of this origin. The source of the fatty material in diabetes has not been shown with certainty.

That the blood, in certain cases of diabetes, is found, *post-mortem*, in a thickened condition, has been shown by numerous records, and it is supposed that this state was due to the excessive drain of its watery portion. On this supposition Dr. Hilton Fagge founded his attempt to treat these comatose patients by intravenous injections of water and of saline solution. In regard to the theory of this third group, "the only evidence that these cases afford in reference to the blood-thickening is to be found in the results of the treatment attempted." Fagge's first case was partially successful, but all the other cases (six in number), subjected to similar measures, were without result, or, at best, quite temporary improvement.

For the first theory, no facts have been adduced beyond mere generalities, and the bare statement of the comatose condition being due to exhaustion of the nervous centres is without support from any other known condition. No form of nervous exhaustion with which we are familiar numbers among its symptoms coma; on the contrary, all the phenomena attendant on the development of diabetic coma point to a poisoned condition of the blood with close analogies to uræmic coma.

Ebstein, whom the author quotes, has shown recently, in the *Deutsches Archiv*, the changes in the renal epithelium which he found in diabetes. These alterations, consisting of various forms of epithelial necrosis, he considers due to a number of conditions of blood changes which have been discovered in diabetes. These conditions do not coexist necessarily in a single case, though all of them are liable to; many of them have been shown to be capable of producing the alterations of the renal epithelium. The alterations consist partly of a hyaline transformation, partly of a disappearance of the nuclei with breaking up of the protoplasm into lumps. The conditions of the blood capable of producing these alterations are deprivation of water in the blood and tissues, hyperglycæmia, acetonæmia, the presence of acetic acid, alcohol, etc.

"Once produced, this necrosis acts prejudicially by preventing the proper elimination of the poisons which circulate in the blood tissues as a result of the morbid metamorphosis, thus determining a condition analogous to, but not identical with, uræmia. A great accumulation of these poisonous products might exceed the powers of even healthy kidneys to excrete them."

From all the evidence at hand, we may conclude that diabetic coma is not due to one condition solely, but to any one of a number of related conditions, or to a combination of several of them. A necessary precursor of the coma is either a very great accumulation of the poisonous products or a changed kidney which fails to remove them from the blood. That the latter is more prominent, we might almost say essential, seems to be shown now that Ebstein has pointed out the alterations of the renal epithelium. It must be remembered that nearly every case of diabetes shows, post mortem, some change in the kidney. Ordinarily, unless the kidneys are grossly altered or else present some of the conditions with which we are familiar in Bright's disease, they have been considered heretofore as normal, and have been so reported. The alterations in size, which have been looked upon as hypertrophy from overwork, are just such changes as Ebstein's epithelial necrosis would be likely to produce.

There are various predisposing and exciting causes which the author points out, such as age, sex, duration of the disease, treatment, various local lesions, fatigue, which have but a doubtful influence in producing death by coma. The details of the onset of the symptom, and of the occurrence of pain usually referred to the abdomen, are all of great interest in these cases. The summary of symptoms given by Senator, and quoted by the author, is exceedingly good.

"Sometimes suddenly without any premonition, sometimes after a first stage of agitation, with general uneasiness, oppression, anxiety, and pain in the region of the stomach, the patient becomes somnolent, moves about restlessly, generally groaning loudly. The pulse becomes frequent, the arterial tension is low, the breathing is hastened and deep, although there is no impediment in either the upper or lower portions of the respiratory apparatus. The extremities become cool, and even the general temperature of the body falls below the natural, and, finally, death ensues amid the deepest coma, sometimes after the supervention of twitchings."

Dr. Pye-Smith presents some *Observations on the Various Forms of Superficial Dermatitis, particularly Erythema, Eczema, Psoriasis, Lichen, and Pityriasis Rubra. With Cases.* He discusses principally the classification of certain forms of skin disease.

The next paper is on *Chronic Bright's Disease without Albuminuria*, and formed a thesis presented for the degree of Bachelor of Medicine of the University of Cambridge, June 16, 1881, by Dr. F. A. Mahomed. The subject of Bright's disease still finds a fruitful field and able cultivators in the seat of its birthplace. The object of this article is to show that not only is the urine in chronic Bright's disease occasionally, or even not infrequently, free from albumen, but to prove that in the earlier stages, and in most cases even in their final stage, the urine from the red granular kidney is most commonly perfectly normal. "More than this, its object is to prove either that chronic Bright's disease is not a renal disease, or else that another disease must be recognized, which constantly precedes and prepares the way for Bright's disease, which may be called arterio-capillary fibrosis, or any other name that may be preferred to it."

After speaking of the various modifications of forms of the kidney in

Bright's disease, he shows "that the changes in the kidney may be arranged under three heads: 1. Epithelial changes: 2. Interstitial cell growth and fibro-hyaline changes; 3. Vascular and perivascular thickenings." "It is with the clinical history of these latter changes that it is proposed to deal at present." Since the changes are in the vascular structures, the cause of the condition must be sought in the vascular system during life. We find it, he suggests, in the increased arterial pressure occurring in all forms of Bright's disease, and this pressure produces directly the vascular alterations. The state of high arterial pressure is therefore to be regarded as an antecedent stage of the vascular alteration, and consequently of granular kidney.

From these considerations, he thinks that "we have to deal with three stages of chronic Bright's disease: First, *the functional stage*, which is limited to the condition of high arterial pressure without organic changes in either the vascular system or the kidneys; second, *chronic Bright's disease without nephritis*, the stage of organic changes in the vascular system and in the kidney (arterio-capillary fibrosis); third, *chronic Bright's disease with nephritis* (cirrhotic kidney and prominent renal symptoms)." It is the second of these stages to which the author devotes attention in this paper, and in it the kidney, to the naked eye, is purely red, more or less granular, the capsule somewhat and perhaps extremely adherent, the cortex atrophied, the arteries thickened, gaping, and prominent, the heart more or less hypertrophied; in some cases the kidney may look perfectly healthy, with perhaps the arteries a little thick. The microscope shows thickening of the *membrana propria* of the tubules, thickened Malpighian capsules, intertubular fibro-hyaline thickening, the arteries thickened by muscular hypertrophy and by fibro-hyaline thickenening of the intima and perhaps of the adventitia; the epithelium normal or only a little granular. These kidneys differ in appearance from those of the third stage in not showing gray or yellowish mottling. The third stage has among its symptoms almost invariably albuminuria, and not unfrequently dropsy, which in the second stage are absent. The diagnosis of these kidneys can be made "by the cardio-vascular symptoms alone."

Of the accuracy and substantial reality of the changes here described as occurring in the kidney there does not seem to be a doubt. This interpretation of the facts has met with no support in Germany, and but few English writers have given it their approval. In truth, as it is here stated, nearly the whole theory is original with the author, and while exceedingly valuable in many respects, we do not think that it will become the accepted view for the progress of the changes in Bright's disease. To note only a single point, it seems defective in explaining the initial steps in progressive cardio-vascular changes.

Mr. FRANCIS GALTON, F.R.S., and Dr. MAHOMED, present *An Inquiry into the Physiognomy of Phthisis by the Method of "Composite Portraiture,"* in which they attempt to prove or disprove the reality or non-reality of a diathesis, and to ascertain whether "certain physical conformations indicate predispositions to certain diseases."

The method employed was to gather a large number of photographs of persons suffering from phthisis. The limits of the age of patients was fixed between fourteen and forty years. Four hundred and forty-two photographs were secured. From these faces it was sought to obtain the average face by which the physical lineaments of the disease could be

shown. The method persued is what is known as "composite portraiture," and may be described as a pictorial average, made by exposing a photographic plate to a series of individual negatives in succession an equal fraction of time. Thus, if it required two hundred seconds of exposure to complete a picture, and it was wished to make a composite of ten faces, each negative would be exposed only the tenth part of the whole time, or twenty seconds, and so on.

For the sake of comparison with the phthisical faces one hundred men and women each, taken unselected from hospital patients, were obtained. After great care in selecting similar faces among the phthisical cases in order to obtain the general average face, and where the numbers are sufficiently large, the uniformity of the results as shown in the composite portraits is very noticeable.

We quote the conclusion which was arrived at. "Finally, we may say that our results appear to lend no countenance to the belief that any special type of face predominates among phthisical patients, nor to the generally entertained opinion, that the narrow, ovoid, or 'tubercular' face is more common in phthisis than *among other diseases*. Whether it is more common than among the rest of the healthy population we cannot at present say."

There are five photographic plates appended to the paper, showing forty-eight figures of composite and individual portraits. M. L.

We shall next consider the surgical papers.

Mr. Charles Higgins contributes a paper on *Distension of the Frontal Sinus*. Four cases of this rather unusual affection are detailed. In each of them the trouble manifested itself as a bony prominence immediately above the region of the lachrymal sac. Upon breaking into the tumour with forceps a quantity of more or less viscid fluid escaped, and it was found easy to establish a communication between the sinus and the nasal cavity by the somewhat forcible use of a probe. A drainage-tube was passed through the opening thus made, and retained for a longer or shorter period, resulting in permanent cure in all four cases. Mr. Higgins has made diligent search through very many surgical authorities and finds but slight mention made of similar cases, yet he thinks they cannot be extremely rare, as he has himself seen no less than seven.

R. E. Carrington, M.D., contributes a *Note on the Triangular Ligament of the Urethra*, in which he criticizes the discriptions of this structure, as given in the standard anatomies. Dr. Carrington thinks that the superficial layer of the triangular ligament is a special fascia, which opinion no authority attempts to controvert. "The deep layer is formed by the obturator fascia, which, anteriorly, is found to stretch across the pubic arch and close it." This discussion of the question is minute, and made clear by diagrams, without the aid of which we can hardly hope to make the matter plain to our readers. Nor, indeed, are we able to see that it is a matter of much importance whether the condensed cellular tissue which goes to form the deep layer of the triangular ligament is derived from a pelvic or obturator reflection. It may account for the course taken by various extravasations, but can hardly influence the steps of any surgical procedure.

A Second Case of Fracture of the Skull, followed by a Collection of Cerebro-Spinal Fluid beneath the Scalp, is narrated by B. Clement Lucas, B.S. Mr. Lucas's first case was told in former volumes of these

Reports, and eventually terminated fatally by meningitis, after a long period of apparently complete recovery. This second case was a simple fracture of the frontal bone, occurring in a child two years old, as the result of a fall. After some days, and the subsidence of the primary swelling, a tumour with fluid contents could be made out over the seat of the fracture. This swelling varied in size from day to day, and with the aid of a hypodermic syringe its contents were found to be "a clear, faintly alkaline fluid, with a few small flakes slightly tinged with blood." Two years and seven months had elapsed at the time the report was written, and the tumour had in great part disappeared, while the child was sufficiently well to attend school. All of the cases of this accident thus far reported, from Guy's, four in number, occurred in children, and Mr. Lucas thinks they cannot occur in adults, as the bones then have too great firmness to permit of their being so far driven in without an external wound. Mr. Lucas does not think that the fluid could have been derived from the subarachnoid space, which contains but little, and when irritated pours out lymph, but is decidedly of the opinion that the anterior cornu of the lateral ventricle was wounded. He is induced to hold this view from the fact that in the post-mortem examination of his first case the descending horn of the ventricle was found to have been injured.

Another very interesting article, by the same author is, *On a Remarkable Instance of Hereditary Tendency to the Production of Supernumerary Digits.* The patients who came under Mr. Lucas's notice belonged to a family which had exhibited this tendency through five generations, and whose great-grandmother had among her eighty descendants no fewer than twenty-four who presented abnormalities. Mr. Lucas calls her the great-grandmother, but as there were no less than five generations, it would seem that this remarkable personage was certainly the great-great-grandmother to her great-grandson's children who came under the care of Mr. Lucas. An ingeniously constructed table makes the whole thing very plain, and Mr. Lucas gives the names of the parties, in case other surgeons should come across descendants of this individual, presenting abnormalities. It is certainly a most interesting case in its bearings upon the question of heredity.

A Case of Osteitis Deformans is contributed by C. J. SYMONDS, M.S., having been under his observation in the person of a woman, in whom it made its first appearance when she was forty-eight years old. It attacked first the left tibia, then the right. After some years the right arm became the seat of aching pains, which disappeared when the left arm became crooked. The gradually effected distortion of the left arm was unaccompanied with pain, at the same time the right hip became deformed and prominent. At the time of reporting the case the patient was sixty-nine years old; and while there is marked deformity of the left forearm and both legs, her principal trouble has been an ulcer upon one of the latter. She enjoys otherwise tolerably good health. A lithograph is given showing the amount of deformity existing in the left forearm.

A very interesting article is *On Three Cases of Reduction en masse*, by N. DAVIES-COLLEY, M.C. More than in almost any other surgical disorder is instruction to be obtained from the study of individual cases of strangulated hernia, for even the most ripe experience will generally find some peculiarity in each case observed. Mr. Davies-Colley puts on record three cases in point. One of them was an inguinal hernia which went up under taxis, carrying the sac with it, and the continued strangu-

lation was only finally relieved by an extended exploratory incision, which revealed the true state of things and averted the impending fatal result. The other two cases were femoral herniæ, in which an operation was done and the sac opened, and yet the bowel went up not into the peritoneal cavity, but into spaces between the peritoneum and the abdominal walls. The writer of the paper thinks that the occurrence of such cases is to be accounted for on the supposition that the attachments of the sac are unusually loose, and that in attempting to insert the finger as a director under the stricture, it does not go far enough, only the most superficial portion of the stricture is notched, and then with the deeper parts unincised the whole sac yields to pressure, and goes into an extra-peritoneal pouch. He urges that where there is any difficulty in placing the finger fairly within the femoral ring, the large flat director should be used, as more certain to enter the abdominal cavity, and that should the bowel not go up freely, the incision should be extended upwards to Poupart's ligament, and even through that structure if necessary, so that a thorough examination of the parts may be made. He thinks it better to divide and ligate the deep epigastric rather than to run the risk of cases terminating as did two of those he reports. The paper is valuable, and should be carefully read. It seems to us to include a very strong argument against doing any operation without opening the sac.

C. H. Golding-Bird, B.A., M.B., has an article *On Chronic Nasal Obstruction*, of which the subdivisions are Ozæna and Adenoid Growths of the Naso-Pharynx. He very properly gives prominence to the scrofulous diathesis which underlies so many cases of ozæna, in which the offensive discharge is not caused by syphilitic disease of the bones. He draws attention to the fact that a certain amount of widening and depression of the nose ensues in long-continued ozæna, dependent upon disease of the mucous membrane, as well as in those cases when there is actual necrosis of bone from syphilis. In these cases, there will also, according to Mr. Golding-Bird's observation, be occasional exfoliation of bone without the presence of a syphilitic taint. The cases narrated are classified as constitutional ozæna, subdivided into *a*, strumous, and *b*, syphilitic, and local ozæna, from blows or other injuries. The second part of the paper, and the more important, is devoted to adenoid growths of the naso-pharynx. Some cases are detailed and the importance of decided local treatment is dwelt upon. This treatment principally consists in removing the growths by scraping, through the mouth. A spoon devised by Mr. Golding-Bird for this purpose is figured.

A paper of very great and permanent value is a *Statistical Account of the Surgical Treatment of Aneurism*, collected from the Hospital Records by Charles J. Symonds, M.S. From its statistical and analytical character it does not admit of condensation, so that we are compelled to satisfy ourselves with merely noticing one or two points, and must refer those of our readers who are interested in the subject to the paper itself. It consists of an examination of eighty-two cases occurring in Guy's between the years 1866 and 1880. Nor does this large number represent all the cases of aneurism which have presented themselves during this period, but is confined to those in which distinctly surgical treatment was resorted to, even traumatic cases treated by division and ligation being excluded. In thirty-two cases the Hunterian operation was done; in three the distal method was employed, and in three the sac was laid open, and the vessel tied above and below, while in forty-three compression was resorted to. For

the last method a success of 56.89 per cent. is claimed. We notice that previous compression appeared to exert an unfavourable effect when it was ultimately found necessary to resort to the ligature. Yet the reporter thinks that other circumstances than the compression were involved in the question and that a conclusion should not be hastily arrived at. He evidently thinks highly of the antiseptic method of treating the wound, and attributes much of the recent success obtained to it. Mr. Symonds attaches much importance to the early closing of the wound, and he is in accord with the best surgical authorities in that respect, but we cannot but question his conclusion, that in order to obtain speedy union the cat-gut ligature must be used, for we regard a carbolized silk ligature as less likely to slip, and almost as apt to cause no local disturbance. Altogether the paper is important as a record of the work done at Guy's, and fitly closes the surgical portion of a volume that assumes its place in the valuable series which we had feared the internal dissensions of two years since had permanently interrupted. S. A.

ART. XVII. — *Diseases of the Rectum and Anus.* By CHARLES B. KELSEY, M.D., Surgeon to St. Paul's Infirmary for Diseases of the Rectum, etc. New York: William Wood & Company, 1882. 8vo. pp. xii., 299. Illustrated.

IT might seem, at first thought, that the disorders of the lower end of the bowel and its adjacent parts had been sufficiently discussed by English and Continental specialists, and that there was no sufficient occasion for a new book of three hundred pages upon this subject. But a careful examination of the work before us shows that it has a good *raison d'être;* and though the author avoids making, in his preface, any formal apology for his production, the simple statement of the reasons why he wrote it is followed by no disappointment as one goes along to the body of the book.

The opening chapter discusses the anatomy and physiology of the rectum and its appendages. This is well done, though most of it at second hand. If the author has opportunity, it would increase the value of his book if he would give us more of the results of his personal dissections and experiments. Possibly, in this case, he might withdraw his apparent endorsement of the opinion that the rectum is intolerant of feces, and that their mere presence excites it to expel them. This opinion is probably founded upon observations made in the dissecting-room; for it certainly would not be suggested by the ordinary experience of the obstetrician, or of one who makes digital examinations of the rectum. To both these it is very exceptional to find a rectum that does not contain a considerable amount of fecal matter, as the author, of course, knows. So that he might speak a little more positively than to say "the normal empty state of the rectum is not universally admitted." His argument against the existence of a third sphincter would be conclusive enough, without the attempts to overthrow assumptions founded directly upon a mistaken notion in regard to the parts below it.

The more practical part of the book begins with the second chapter, which treats of "Congenital Malformations of the Rectum and Anus." In

this the author follows the classification of Papendorf, published a century ago, viz., narrowing; membranous occlusion; absence of anus with blind ending of rectum; presence of anus with blind ending of rectum; absence of anus with open ending of rectum at an abnormal external point; absence of anus with ending of rectum in the bladder, urethra, or vagina; opening of ureters, uterus, or vagina into rectum; total absence of rectum; absence of colon. Some of these various malformations are illustrated by cases. The treatment recommended is immediate operation, preferably that of Amussat (which he spells, p. 39, with two m's), called proctoplasty. This consists in dissecting up to the rectal pouch and opening it, drawing it down and stitching its edges to the skin. If this operation be not feasible, he recommends left inguinal colotomy. Any subsequent attempt to establish an opening in the normal situation, he says, is very dangerous, but gives an account of a very ingenious and successful operation of this sort by Dr. Byrd, of St. Louis.

In Chapter III., which treats of methods of examination and operation in general, the author is manifestly at home. Opening with an injunction to thoroughness and carefulness, which can never be too often repeated or too strongly urged, he illustrates their importance by a case of his own, where a patient had a fistula, a fissure, a polyp, and an eczema of the margin of the anus. A suitable warning against trusting too implicitly to subjective symptoms is given in a way that seems to indicate some failure to appreciate the greater difficulty with which general practitioners can secure direct examination, as compared with specialists. The warning, however, is needed enough, and the advice in regard to carrying out an examination is most excellent. The author's plan of using bougies made of soft red rubber commends itself to the judgment; for, as he remarks, "A patient may easily recover from a false passage made in the urethra, but such will seldom be the case with the rectum, for here, when the instrument leaves the bowel, it enters the peritoneum." His suggestions in regard to the treatment of hemorrhage after operation and attention to the state of the bladder likewise bear the marks of practical experience.

The next chapter considers "Inflammation of the Rectum," comprises but four pages, and is less satisfactory than some of the others.

The fifth chapter takes up the subject of "Abscess and Fistula." This is another good chapter, and full of little hints that are valuable, as, for example, that, after opening an abscess in the earlier stage, "a free hemorrhage from cutaneous vessels is not uncommon, nor, on account of its antiphlogistic action, is it to be deprecated." Since venesection has gone out of vogue, moderate hemorrhages sometimes cause more anxiety and excitement than there is good reason for. This the author evidently appreciates. But he is no advocate of carelessness about bleeding, for he follows the remarks just quoted with a timely caution against opening perirectal abscesses in the surgeon's office and allowing the patient to walk home—lest an artery should start to bleed during the walk. The frequent coexistence of stricture and fistula the author would explain by stating that "a stricture may act as the exciting cause of a deep abscess by the impairment of vitality and nutrition which it causes." This is an unsatisfactory attempt, and it would, at present, be more candid to say the connection is not yet understood. The author lays stress upon the importance of treating abscesses "of the superior pelvi-rectal space" as abscesses, and not as fistulæ; that is, of not laying them open into the bowel. This, he says, is a point generally misunderstood in practice.

Fistulæ proper are well described and well illustrated in this connection. When we look for the author's opinions as to operative interference, we find that he considers "certain cases of Bright's disease, cancer, cardiac and hepatic affections, etc.," as unfit for operation. But we are somewhat disappointed that he is not more specific as to what these "certain cases" are. In regard to phthisical patients he is clear and outspoken enough. "I believe it," he says, "to be a safe rule to operate upon phthisical patients as upon others, being led by the idea that one exhausting disease —phthisis—is better than two—phthisis and fistula." And he adds the comfortable assurance that he has yet to meet the first case which, under suitable and careful general and local treatment, refused to heal after operation. Operating with the elastic ligature, he regards as only a substitute for the use of the knife, which he very much prefers. Of course, he prefers one of his own invention, which, he frankly states, he found, after having it manufactured, exactly resembled those in use in the fourteenth and fifteenth centuries. He shares the opinion of Mr. Smith, of London, that "stuffing" the line of incision is not appropriate, but only such a gentle insertion of lint, or other material, as will suffice to keep the edges apart.

The next chapter is on "Hemorrhoids," at which we can only stop long enough to note that the author prefers the treatment of internal piles by ligation, though he speaks highly of the injections into them of carbolic acid, saying that the more he practises it, the more confidence it inspires him with. We must also note the recommendation for reduction of strangulated piles, which are those usual in the text-books, but which we think might be improved by substituting, in many cases, etherization and immediate reduction for emollients and forty-eight hours' delay.

The seventh chapter treats of "Prolapse," and, among other suggestions, the author states that he has had good results in treating the prolapse attending old internal hemorrhoids with carbolic acid injections. In invaginations, unless milder measures are soon effective, he approves of promptly opening the abdomen and freeing the obstructed intestine.

Passing now by the chapters on non-malignant growths, ulcerations, and strictures of the rectum, we turn to that on "Cancer." Here we find certain conclusions in regard to operations for its removal, drawn from an analysis of one hundred and forty cases, two of which may be epitomized as follows: 1st. Delay in recurrence after excision is rare, and, therefore, the risks involved in removing extensive disease are not justifiable. 2d. The operation is chiefly valuable as a palliative, and as such compares favourably with colotomy. The author ridicules the reports of French surgeons of patients "*parfaitement guéries*" in a few weeks. This is hardly fair to the French. Only so recently as June, 1882, at a meeting of the Surgical Society of Paris, there was a discussion on the subject in which Trelat, Després, Sée, Verneuil and others took part, and the opinions expressed were of the most moderate and conservative sort. Very few men nowadays would make the slip of speaking of the "cure" of malignant disease, when they ought to speak of "recovery" from an operation for its removal.

The author considers attempts to remove growths high up in the lower bowel, by abdominal incision, as justifiable, and even indorses an exploratory incision when the location is only probable.

The next chapter discusses "Impacted Feces and Foreign Bodies." Of the latter, a number of curious and more or less instructive accounts are cited. In regard to the former, a remark is made which we cannot

forbear to quote, viz.: "Just as the practitioner has to learn that incontinence of urine may be a sign of a distended and not an empty bladder, so he may have to learn by a disagreeable error in diagnosis, that a diarrhœa is sometimes a result of an overfilled and obstructed rectum."

In the next chapter, the author treats of some disorders of the verge of the anus, on which the only comment we have to make is, that what is already good would be better if the reference to "*eczema marginatum*" (which is a misnomer of Hebra's) were made more exact, and more conformed to the most recent classification of skin diseases.

In the final chapter, he takes up briefly Spasm, Neuralgia, Wounds, Spontaneous Rupture, and Rectal Alimentation. The latter occupies half of the chapter, and forms a useful *addendum* to the matters more proper to the title of the book.

We have, then, a very excellent work here. One not without some minor imperfections, but one which we regard as the best we know of on this subject. It is orderly, comprehensive, and erudite; its style is clear and its tone pleasant. It bears the marks of extensive and scholarly reading, and of a wise use of experience. We have no hesitation in recommending it to all who would know more about this subject than it is possible for general treatises on surgery or medicine to teach.

The value of the subject matter is enhanced by the numerous and excellent illustrations which the book contains, and we congratulate the publishers upon the happy combination of good matter and good form which marks this number of their Library of Standard Medical Authors.

C. W. D.

ART. XVIII.—*De la Dilatation de l'Estomac.* Par le Dr. H. THIÉBAUT, Chef de Clinique à la Faculté de Médecine de Nancy, Ancien Interne des Hôpitaux, Laureat de la Faculté. Avec deux planches. Paris: J. B. Baillière et Fils.

Dilatation of the Stomach. By Dr. H. THIÉBAUT, etc. 1882.

THIS monograph is somewhat outside of the usual line of medical literature. We are so accustomed to see the subject receive only a short notice of a few pages from some of our writers on the Practice of Medicine, that the essay of 244 pages quite surprises us, and we wonder whether the writer really intended it or not. The monograph opens with an introductory chapter of 46 pages, giving the history of this obscure affection. He shows that its obscurity—rather the obscurity of our knowledge concerning it—is not due to its late recognition by the profession, for Hippocrates and Galen both mention it. The writers of the seventeenth century—Plater, Joden, Fabricius Aquapendente, Spigelius, Bauhin, Bonet, who suggested that it might be due to stenosis of the intestine, and Mauchart, who recorded one of the most capacious stomachs on record—all seem to have mentioned it, according to Thiébaut, as a curiosity in medical science rather than as a disease to be treated. Even in the first half of the eighteenth century the extent of the knowledge of its etiology was summed up in these words by Behr: "Of all people, drunkards have the most voluminous stomachs." Van Swieten made a more careful study of the affection, and concluded regarding its etiology: "If the stomach is filled

with a great quantity of food, the two orifices contract spasmodically, and the way of exit is closed. At this time the food and the air swallowed increase in volume on account of the heat. The enlargement of the organ finally becomes so great that the neighbouring organs are pressed upon. When the stomach has undergone a prolonged expansion it loses its contractility, and not only the walls but the orifices are partially paralyzed."[1]

In 1830, J. Frank (*fils*) attempted a classification based entirely on the etiology of the disease. He recognized four varieties of causes: (*a*) Obstacles to the free exit of the food; (*b*) Polyphagia; (*c*) Lax condition and softening of the mucous membrane; (*d*) Hypernutrition. Naumann, in 1834, gave three causes, rather three varieties: (1) Hypertrophic dilatation. (2) Atrophic dilatation. (3) Dilatation by stenosis. Mr. Clifford Albutt would probably be surprised to see that he is referred to as "Deux Anglais, Clifford et Albutt." Dujardin-Beaumetz is convinced that atonic dyspepsia, flatulent dyspepsia, and dilatation of the stomach, are only different degrees of paresis of the muscular layer, indicating "tetanisants." Damaschino regards it as a morbid state common to a number of gastric affections, and rarely having a separate existence. Germain Sée considers this "ampliation" as an exclusively physical phenomenon, having no relation with dyspepsia: "There is not the least correlation between the two states, dyspepsia being transitory and dilatation permanent." Is he correct in either proposition?

Chapter II. concerns the etiology, microscopy, pathological histology, and the pathogeny of the affection as based on the data furnished by the microscope. The author makes two great classes: (1) Acute, and (2) chronic dilatation. The acute form is produced in the course of febrile gastric affections, in simple indigestion, and after the ingestion of substances capable of acquiring a large volume in the stomach. It has also been frequently observed after certain traumatisms. Kœberlé, in 1873, noted the frequency of the affection in the course of the peritonitis following ovariotomy, and F. Gross records a case in which it was very marked after an operation for strangulated hernia. Was the stomach dilated in these cases, or was there only the usual tympanites? Twenty-nine illustrative cases are given in this chapter. Case I. was one of strangulated hernia, for which kelotomy was performed; patient died of pulmonary congestion; the stomach at the autopsy had a capacity of three litres. Case III. Old epiploïc hernia; reduction without strangulation; reflex vomiting; acute dilatation; gastrorrhœa; choleriform state; death. In this case the stomach-tube was frequently used, about two litres of fluid being evacuated each time, but the stomach was almost immediately refilled. This incessant loss produced a choleriform state, followed by death. The causes of chronic dilatation of the stomach seem to be very numerous, including: (1) Febrile gastric catarrh. (2) Organic lesions seated at the pylorus. Of these, congenital stenosis is rare: one case is reported by Pauli and one by Landerer. Cancer is most frequent of all these causes; fibrous hypertrophy of the sphincter. The cause of this is generally obscure, but Blot has recorded a case in which it was due to the irritation caused by a foreign body, and Dujardin-Beaumetz one in which it was caused by swallowing sulphuric acid. Hydatid cysts are also to be

[1] The author quotes a case from Morgagni (observed by Valsalva) in which the stomach descended into the hypogastric region. I find, however, that he has mistaken a case of prolapsus for dilatation. In another case Morgagni remarks, of an autopsy, "The stomach was very large, as is usually the case with drunkards."

mentioned in this connection. (3) Spasmodic contractions, or strictures of the pyloric ring. (4) Strictures of the intestine. (5) Adherence of the internal surface of the organ. (6) Immoderate ingestion of food or drinks. (7) Frequent eating. (8) Irritating ingesta. (9) Excessive production of gastric juice and insufficient absorption of the peptones. (10) Dyspepsia. (11) Chronic gastric catarrh. (12) Cancerous infiltration. (13) Destruction of the muscular fibres of the stomach. (14) Muscular asthenia and paralysis. (15) Repeated vomiting. (16) Affections of the liver. (17) Cardiac affections. (18) General diseases, as—(*a*) Tuberculosis; (*b*) Alcoholism; (*c*) Typhoid and puerperal fever; (*d*) Hysteria; (*e*) Hypochondriasis; (*f*) Cerebro-cardiac neurosis. This is a truly formidable array, and, if a "true bill," one must almost conclude that the normal state of the human stomach is that of chronic dilatation.

After describing the pathological alterations the author discusses them with the view of interpreting their meaning, and determining the pathogeny of dilatation. The most striking facts, he says, are the great changes in the mucous membrane as regarding the etiology of dilatation. He classes the causes, as much as possible, in the order of their etiological importance. (1) Pyloric or duodenal obstructions. (2) Chronic catarrh, simple, or complicated with ulcer; dyspepsia, simple or with acute or chronic gastrorrhœa. (3) Tuberculosis. (4) Frequent eating; polyphagia, polydipsia; indigestible or irritating food. (5) Muscular paresis; pyrexiæ. (6) Cerebro-spinal and cerebro-gastro-cardiac neuroses. (7) Organic diseases of the liver and heart. (8) Frequently recurring acute dilatations. (9) Repeated and frequent vomiting. (10) Pregnancy. The following are causes, but very rare; (1) Sudden bending or flexure of the duodenum. (2) External adherences of the stomach, and (3) Hysterical convulsions.

The author seems to divide the symptoms of the disease into five sets or classes, the first being the "Functional Disorders in the Digestive Act." These include disorders of appetite, epigastric pain, nausea, and regurgitation of food, vomiting, several pages being given to this last symptom. He regards it as almost pathognomonic of advanced dilatation when the vomited matters each day consist of food taken the day or several days before.

When the matters vomited or evacuated by the sound are placed in a vessel and left quiet for some time, they form themselves into three layers. The upper, muco-spumous, resembling the confervæ seen on the surface of stagnant water; the middle is serous; the lower is grumous and composed of the *débris* of the ingesta. Microscopic examination he regards as very important. Reference is made to a case of dyspepsia (Case 39) with constant sensation of fulness of the stomach, fetid eructations, and copious vomiting. Examination showed striated muscular fibres, for the most part intact; those dissociated were more or less swollen, their transverse striation had disappeared, but the longitudinal striæ were apparent. Of the ingesta of the day previous there remained scarcely recognizable grains of starch and globules of free fat. Sarcinæ were seen, having at their sides a great number of animated vibriones. These results shown by the microscope proved: (1) That the vomiting did not totally expel the contents of the stomach. (2) That the muscular tissue which had remained in the stomach for fourteen hours and perhaps longer, was scarcely altered at all. (3) That the starch swelled up and the fat was emulsionized. (4) That, following their stagnation in the stomach, the ingesta began to putrefy. Chemical examination of the vomited matters

in the case referred to showed in 170 c. c., 30 grms. of peptones, and only 0.98 grm. of coagulable albumen in an acid liquid, but having no digestive power. In another case there were only 3.72 grms. of albuminose and 3.90 grms. of albumen, the liquid being very acid, containing no pepsin, and having no action on white of egg. Pepsin being added to this, artificial digestion commenced.

Chemical examination, of liquid evacuated by the stomach tube, by Prof. Ritter, gave the following result:—

Quantity	170 c. c.
Sp. gr.	1025

Acid liquid with no digestive power.

Acidity per 1000 (sulphuric acid valuation) 5.24 grms., 3.15 grms. being inorganic (hydrochloric?)

Coagulable albumen	0.98 grm.
Peptones	30.01
Salts	9.15
Extractive matters	9.50
Total per 1000	49.64 grms.

Beside the vomited matters just described, they sometimes appear simply as aqueous or bloody matters. In one case of watery vomiting as much as 8 or 10 litres were evacuated in twenty-four hours. The author thinks that this is simply due to osmosis from the capillaries. With regard to the intestinal disorders, constipation is most constant, and often very obstinate, though diarrhœa may come on, which, the author seems to think, is generally a consequence of the former affection. It may be due, however, to the irritation produced by the altered and irritating contents of the stomach.

In spite of the disturbance of the gastric function there is not that state of general *malnutrition* which one would suppose to be an inevitable consequence; in many cases the sufferers do not lose flesh, and for this and other reasons the diagnosis may be difficult. According to Küssmaul the urine undergoes a diminution proportional to the amount of the vomiting, this being due to the diminution of the water of the blood. The author, however, has made no special observations on this subject.

Dilatation gives rise to a number of nervous phenomena, as muscular cramps, epileptiform seizures, psychical troubles, and troubles of general sensibility. Küssmaul, with whom the author is inclined to agree, attributes the cramps to the sudden condensation of the blood in the same manner that they are produced in cholera. The epileptiform attacks are not preceded by the initial cry, by the foaming at the mouth, or by the tooth-marks on the tongue. They are the result of a mesocephalic anæmia arising from the serous and sanguineous losses. As regarding the psychical troubles there may be partial or total delirium. Vertigo is a frequent symptom; *vertigo a stomacho læso.* Besides the nervous troubles due to encephalic irritation, troubles of general sensibility occur, subjective sensations more or less painful which torment the sufferers and render them hypochondrical. These are the cases in which errors of diagnosis are most likely to occur, for the sufferer is so much absorbed in these sensations that he forgets to mention the gastric trouble which is the source of all the mischief.

Dilatation of the stomach seems to present itself under one of four different types: (1) that in which there is an absence of functional symptoms; (2) in which the nervous symptoms predominate; (3) in which there are intermittent gastric symptoms; (4) the gastric troubles being habitual.

The author describes a gastrometer, invented by himself, for measuring the size of the dilated stomach. It consists: (1) of an ordinary œsophageal sound of small calibre, number 24 Charrière, graduated, on its exterior surface, in centimetres, this scale having 49 divisions; (2) a small mass of lead, weighing 6 grams, attached to the extremity of the sound. A silk thread 80 cm. long, attached to the lead, passes through the sound and is attached to an ivory plate at the mouth-end. The whole instrument then is 50 cm. long, the piece of lead measuring 1 cm. When used the external end of the silk thread is held taut so as to keep the weight at the other end in place. The sound is passed into the œsophagus and through the cardiac sphincter. The thread is then relaxed and the weight descends to the greater curvature of the stomach. Then the observer notes the number of centimetres shown by the sound back of the dental arch. To deduce any satisfactory results from this method it is necessary to know the measurement of the normal stomach. The author found this to be, after measuring the stomachs of several cadavers, about 45 cm. From his description it seems that the apparatus is not very exact, but it is more than probable that it may be so modified as to give very definite results.

He believes that the disease is much more frequent than is generally supposed. It seems to be a disease peculiar to adult and middle life, there being very few cases in the very old or very young, and has a constantly progressive tendency. He has seen no case of spontaneous recovery, but does not believe it impossible. As stated before, the diagnosis may be very difficult. In one case pregnancy was first diagnosed, then dropsy; the autopsy revealed a stomach with a capacity of thirty-four *pounds* (?). Rilliet had a case in which he was doubtful as to whether there was an abdominal cyst or a tumor of the epiploön. It may also be confounded with a dilated transverse colon, or with a stomach which has assumed the vertical position. We will merely mention the different methods of treatment discussed by the author. He seems to consider thorough and frequent washing out of the stomach as of great importance. Alkaline water should be used. For fetid eructations, sarcinæ, and putridity of the contents of the stomach, salicylate of soda is recommended. Sulphate of soda, bromide of potassium, or Karlsbad salts are indicated when there is an abundant excretion of liquid. Hypodermics of strychnine are recommended on account of the well-known action of this drug in causing a contraction of the whole digestive tube and giving it tone. The induced current seems to have been of great service in many cases, but it must be persevered in. As to the alimentary *régime*, milk diet is not favourably thought of by the author. He thinks that a heavy midday meal is a great factor in causing dilatation and keeping it up. Fats and leguminous vegetables as well as alcoholic drinks should be forbidden. The following seems to include his whole system of diet: nourish, without fatiguing, with nutritive and easily assimilable food. The author writes as though he understood his subject, and the book is interesting and well worth careful study. W. G. E.

ART. XIX.—*Transactions of the American Ophthalmological Society. Eighteenth Annual Meeting.* 8vo. pp. 442. New York, 1882.

THE meeting was held at Lake George, and was attended by twenty-five members. The proceedings of the society were commenced by the announcement of the death of one of its honorary members, Dr. Edward Reynolds, of Boston, and a short sketch of his life has been prepared by Dr. Hasket Derby.

Dr. Reynolds, who died at the age of ninety years, was the oldest ophthalmic surgeon in the country, and was one of the founders of the Massachusetts Charitable Eye and Ear Infirmary. He studied abroad under Abernethy, Astley Cooper, and Dupuytren, and, soon after his return, laid the foundation of an extensive practice in ophthalmic surgery by a successful operation for cataract upon his own father. Of late years he had retired from active practice, but was for a long time the leading ophthalmic surgeon of New England.

A case of *Pulsating Vascular Tumour of the Orbit, Eyelid, Temple, and Forehead, treated by Electrolysis*, is reported by Dr. CHAS. STEDMAN BULL, of New York. The patient was a female child a year old, and, with the exception of the tumour, in perfect health. A day or two after birth two small whitish spots had been noticed just above the left eyebrow, which in a few weeks grew red, and about the same time the lid began to swell. When the child was three months old there was a purple tumour as large as its two closed fists involving the upper eyelid, side of nose, forehead, and temple. The eyeball was pushed downward and inward, towards the nose. The main swelling was in the subcutaneous tissue of the lid and eyebrow, and in the orbital tissue, while the skin was the seat of a pure nævus. At the apex of the tumour the skin was very thin, and fluctuated on pressure, and a slight pulsation could be seen. There was also a nævus upon the forearm about the size of a ten-cent piece. The growth of the tumour seemed to be checked for a time by the administration of ergot, but afterwards progressed rapidly.

Between March 28th and April 11th four applications of the electrolytic method were made, under ether, each resulting in slight condensation. The parents then insisted upon removing the child from the hospital. The area of condensation was about an inch and a quarter in diameter, and was increasing slowly.

Dr. W. N. SEELY, of Cincinnati, describes a case of *Atrophied Remains of the Hyaloid System attached to the Posterior Pole of the Lens, and detached from the Papilla*, and states that he can find no record of a similar case. He also reports a case of *Serous Effusion into the Vitreous Humour, causing total temporary loss of Vision, due probably to Malarial Poisoning; recovery.*

A case of *Apparent Disappearance of Iris after Extraction of Cataract*, is reported by Dr. R. J. MCKAY, of Wilmington, Del. The extraction was made by the Graefe method, with iridectomy upwards, and the anterior chamber was immediately filled with blood. When the blood-clot was absorbed, the iris was found to be entirely absent. Several other members mentioned similar cases, and believed the condition to be due to a reduplication of the iris backwards.

Dr. McKay also reports a case of *Non pulsating Exophthalmos, with Recurring Thrombosis of Orbital Veins.* The patient was a married

woman, twenty-eight years of age. A protrusion of the right eye was first noticed when she was ten years of age. It was subject afterwards to temporary exacerbations during her menstrual periods. She had had three children, and the protrusion enlarged considerably during each labour. When first seen by the author, the eye was protruded three-fourths of an inch, and the eyelid, though greatly distended, could not be completely closed. The media were clear, and vision still equalled $\frac{15}{30}$. The ball could not be replaced by pressure, and its movements were much restricted. Nodules of distended veins could be felt at the inner angle of the orbit and above the eye. Subsequently vision was lost, and the ophthalmoscope showed optic neuritis, and soon afterwards sloughing of the cornea and general ophthalmitis necessitated extirpation. The orbit seemed filled with a mass of varicose veins.

In a paper on *Hereditary Atrophy of the Optic Nerves*, Dr. Wm. F. Norris, of Philadelphia, gives a history of this disease affecting one or more members of four generations, and compares it with retinitis pigmentosa. Both affections are frequently hereditary, but while optic atrophy commences after puberty, often in middle life, and cuts off the central vision first, retinitis pigmentosa commences usually in early life, and attacks the periphery of the retina first, frequently leaving the central vision intact for many years. In two cases treated by Dr. Norris the peripheral vision was improved by strychnia, but the central scotoma was not affected.

Dr. Wm. S. Little, of Philadelphia, discusses *The Influence of the Faradic Current on the Treatment of Vitreous Opacities*, and reports several cases that improved under its use.

Dr. C. S. Merrill, of Albany, N. Y., contributes a *Report of a Case of Glioma in a patient twenty-one years of age.* The point of special interest is the age of the patient, as retinal glioma is usually a disease of childhood. The author states that there is no other case on record in which glioma commenced at so advanced an age. The eye was extirpated in October, 1878, and there has been no return of the disease.

Dr. Richard H. Derby, of New York, reports *A Case of Anæsthesia of the Retina, with Concentric Limitation of the Fields of Vision; recovery through Inhalations of Nitrite of Amyl.* The patient was a nervous child eight years of age, with vision reduced to about one-half, and very marked limitation of the fields. The ophthalmoscope showed paleness of the optic disks. "The interesting features in this case are the very marked depreciation of vision, the unusual degree of concentric limitation of the fields, both persisting for two months or more, and the relief following the use of nitrite of amyl, and that relief maintained."

Case of Remains of the Hyaloid Artery attached to the Crystalline Lens; Anæsthesia of the Retina, is described by Dr. W. S. Little, of Philadelphia.

Dr. Samuel Theobald, of Baltimore, reports a case of *Circumscribed Absorption of the Lens apparently of Traumatic Origin, without the remainder of the Lens becoming Opaque.* There was a small dense opacity of the cornea, near its outer margin, to which a tag of the iris was adherent, and behind this point a crescentic notch on the margin of the lens. A narrow rim of opaque lens substance formed the margin of the notch. Drs. Knapp and Kipp thought it possible that this condition might be congenital.

Dr. Theobald also contributes the history of a case in which *a frag-*

ment of glass remained in the eye, probably in the ciliary body, for ten years without producing serious consequences. The patient presented himself to Dr. T., immediately after the accident, and a minute particle of glass was seen, by oblique illumination, in the anterior chamber. When the pupil was dilated by atropia, the fragment fell behind the iris and was lost. Considerable pain, tenderness of the ciliary region, and slight iritis followed, but lasted only a few days, and there has been no trouble since. Several other members reported instances of the toleration of small foreign bodies in the iris, lens, and retina.

Dr. G. HAY, of Boston, records *A Case of Extensive Hemorrhage between Choroid and Sclerotic*, in which the ophthalmoscopic appearances could not be distinguished from those of intraocular tumour. Drs. Knapp and Pooley referred to similar cases in which the eyes had been extirpated for supposed sarcoma and glioma.

Dr. F. BULLER, of Montreal, Canada, gives a description of a *Peculiar Case of Alopecia of the Eyelids*, accompanied with drawings of microscopic specimens of the diseased cili. The patient was a young lady in good health, and with eyes in other respects perfectly normal. There was not even thickening or inflammation of the edges of the lids, but the upper lashes had been falling out for eighteen months, and decided disfigurement resulted. The most interesting feature of the case "is the presence of a thread-like material wound round the hair, extending from the bulb to a certain distance up the shaft, but never beyond the point of emergence of the hair from its follicle." The author is not satisfied as to the nature of this structure, but suggests that it may be a parasitic growth.

Dr. HENRY D. NOYES, of New York, recommends the use of a convex lens attached to the forefinger by means of a ring, for focal illumination in the *removal of foreign bodies from the cornea.*

Dr. Noyes also reports *Three Cases of Tumours of the Eye.* I. A smooth firm growth was attached to the conjunctiva, caruncle, inner half of the lower lid and to the periosteum of the inner wall and floor of the orbit. No enlargement of lymphatic glands. The tumour was removed without extirpating the ball; healing was rapid and the sight remained good. Three months and a half after the operation, a swelling appeared in front of the ear and increased rapidly, and coalesced with another which afterwards formed under the ear. There was no sign of a return of the disease in the original situation. The patient, a man 51 years of age, died from exhaustion six months after the operation. In addition to the large growth near the ear, there were small nodules on the forehead, over the parietal bone and at the vertex; all except the second penetrating the bone. That on the forehead perforated the skull, and was found to be adherent to the dura. Nodules were also found in the lungs, pancreas, and brain. The author considers it a case of melanotic sarcoma. II. Epithelial cancer of ocular conjunctiva. removed from a patient seventy-one years of age. No recurrence after two years. III. Choroidal sarcoma. Symptoms of irritation of the other eye, which had been thought to be sympathetic found to be due to hypermetropic astigmatism.

Dr. H. KNAPP, of New York, presents a *Contribution to the Clinical History of Metastatic Irido-Choroiditis.* It is founded upon "The observation of the case of a young lady who, by exposure during menstruation, contracted in the lower part of the abdomen an inflammation, which was followed by transient internal ophthalmia in one eye, and purulent irido-choroiditis, with destruction of the globe in the other." The author be-

lieves that there may be mild cases of metastatic irido-choroiditis which do not lead to destruction of the eye; as mild pyæmic inflammations are known to occur in other organs.

He recommends quinine and the application of cold before panophthalmitis is evidently established; after this period, palliative measures only are indicated.

Dr. G. C. HARLAN, of Philadelphia, describes *A Simple Test for Simulated Monocular Blindness*, and gives several cases in illustration. The patient's attention is concentrated upon the eye with which he admits that he can see, and a strong convex glass is held before it; if he reads fine print at some distance beyond the focus of the glass, vision in the other eye is proved.

Dr. Harlan also reports a case of *Sarcoma of the Lachrymal Gland.* The tumour occupied the position of the upper lid, and was as large as a hen's egg. The eyeball was forced completely out of the orbit, being dislocated forward, downward, and outward, and fixed immovably. Two weeks after the removal of the tumour, the eyeball had resumed nearly its natural position.

The protrusion of the eyeball outward, instead of inward, was considered unique. It was attributed to the great size of the growth, which failed to find room to expand in the position of the lachrymal gland, and, therefore, developed toward the inner side of the orbit. Several other members referred to cases of sarcoma of the lachrymal gland, which, however, are considered rare.

A Case in which an Attack of Acute Inflammatory Glaucoma was immediately followed by Inflammation of the Brain is reported by Dr. CHARLES J. KIPP, of Newark, N. J. Iridectomy was performed with partial and temporary relief, but the headache and nausea continued. The pain and inflammation in the eye returned three weeks afterwards, and the other eye was attacked. Iridectomy failed to benefit the second eye. Convulsions, delirium, and coma followed, and the patient died sixty-seven days after the first operation. The author thinks it probable that the cerebral disease existed at the time when the glaucoma first manifested itself, and was the cause, rather than the result of the affection of the eyes. There was no autopsy.

Dr. W. F. MITTENDORF, of New York, records three cases of *Embolism of the Central Artery of the Retina.* All the patients had previously suffered from rheumatism and had valvular disease of the heart. In one, a portion of the retina near the optic disk was supplied by a ciliary artery, a not very infrequent anomaly, and vision was retained in the corresponding part of the field. In all the cases the onset of the disease was sudden and occurred after violent exercise.

Dr. S. B. ST. JOHN, of Hartford, Conn., reports a case of *Double Glaucoma fulminans*, and one of the *Extraction of a piece of Iron from the Lens by means of the Permanent Magnet.* The onset was very sudden and violent in both eyes, in the case of glaucoma, and vision was reduced in each to the ability to count fingers. The second eye was attacked only one week after the commencement of the disease in the first. Iridectomy relieved all the symptoms and restored vision $\frac{1}{30}$ in one eye and $\frac{1}{70}$ in the other.

The piece of iron had been in the lens, which had become cataractous, for three months. In the attempt to make an iridectomy, softened lens matter was extruded into the anterior chamber, carrying with it the foreign body, which was removed by means of the Gruening magnet.

Dr. EDWARD G. LORING, of New York, contributes a paper on *Premature Delivery for the Prevention of Blindness.* After citing several cases in illustration of the fact that vision is frequently lost during gestation from albuminuric retinitis or optic atrophy, the author refers to others in which this result has been prevented by premature delivery, either occurring without medical interference, or induced with the object of saving life. He then reports the case of a woman who had had three confinements and had suffered an impairment of vision with each, until sight was entirely gone in one eye and seriously damaged in the other. She became pregnant a fourth time, and, by Dr. Loring's advice, premature delivery was brought on, when the fœtus was three months old. There was no further diminution of vision.

The author concludes that "when a marked deterioration of vision has occurred, with or without ophthalmoscopic changes, and when blindness is threatened, premature delivery is not only justifiable but often demanded;" and that "when a permanent loss of vision has occurred from a preceding pregnancy, premature delivery in a subsequent one, when surrounded by its proper safeguards, is not only justifiable but at times absolutely necessary." From a legal point of view the proceeding is justified by the consideration that in operating to save sight, in such cases, we are also operating to save life, as "given, a pregnant woman with loss of vision, or organic lesion of the retina or optic nerve, as the prominent, or even as the sole symptom, no one can say that a series of convulsions may not set in at any moment which will carry everything before them, including not only the life of the child but also that of the mother."

Dr. Loring also records a *Case of Osteoma of the Conjunctiva*, congenital in its origin; and describes *An Improved Means of Oblique Illumination—a Conical Condenser*, consisting of a convex lens attached to a forehead band by means of an arm, broken at various points by ball-and-socket joints so as to admit of free movement in all directions.

Dr. G. C. HARLAN, of Philadelphia, describes an *Improved Trial Frame*, for test glasses, very much lighter than those in general use. G. C. H.

ART. XX.—*Chapters in the History of the Insane of the British Isles.* By DANIEL HACK TUKE, M.D., F.R.C.P., President of the Medico-Psychological Association, etc. 8vo. pp. 548. London, 1882.

THE substance of this volume is expressed in its title, and the eleven chapters into which it is divided, contain a vast amount of information, deeply interesting not only to the psychological student, but to the philanthropist, and also to the legislator, who, of late years, nearly everywhere, and especially in Great Britain and the United States, has been very frequently called on to enact laws for all the dependent classes, and especially for those whom disease has bereft of the use of their reason.

It is, however, only the diligent student, particularly interested in the subject under investigation, that could patiently cull from the many sources referred to, the information condensed in this volume. Commencing with the early medical and superstitious treatment of the insane, the author has collected a mass of records specially interesting, as illustrative

of the ignorance, and the resulting faith of all classes of people in these early days, when there was only the faintest pretence of anything like treatment given to the unfortunate subjects of mental disorders.

The first chapter of our author's work is mainly devoted to a consideration of these forms of superstitious treatment and to that of the administration of medicine which could claim little superiority over those just referred to. During this period, too, gross cruelty was used alike in nearly every part of England, Scotland, and Ireland. At this early time, the most perfect faith was given in the influence of the moon, and so prevalent and fixed has this impression been, that even at the present time, the many terms indicative of this origin, are still common with not a few legal, medical, and literary writers. All through this period too, the healing powers of different wells were held in great repute, that of St. Winifred being specially celebrated. There were also other hardly less famous wells at Struthill in Stirlingshire, at St. Ronans, and on a small island in Lochmaree, besides various others. At the last named indeed, even as late as 1850, individuals were subjected to this form of treatment.

Coming back to England, in the early and middle part of the sixteenth century, the reader will learn of a certain Dr. Borde, distinguished as a writer and a practitioner. One chapter of his book is headed "An order and a dyett for them the whiche be madde and out of their wytte," and in it he gives this counsel, "I do advertyse every man which is madde or lunatycke, or frantycke, or demonyacke, to be kept in safegarde in some close house or chamber where there is lytell light; and that we have a keeper the whiche the madde man do feare." Many of his suggestions, however, are not unkind, however peculiar they may have been.

A hundred years after Borde wrote, the first edition of Burton's *Anatomy of Melancholy* was published, in 1621. Burton thought it a medical, as Coke and Hale, his contemporaries thought it a legal fact, that witchcraft was one of the undoubted causes of insanity. These legal authorities had other distinguished medical men to support them in their views, such as Sir Thomas Browne and Sir Theodore de Mayerne, who had the distinction of being the physician of five crowned heads, viz., of Henry IV. of France, James I. of England, Anne of Denmark, Charles I. and Charles II. This favoured court physician was truly called a polypharmacist, one of his prescriptions containing as many as twenty-seven ingredients, and his "besoartick pastills" contained a still greater number, among which was the skull of a stag and of a healthy man who had been executed. The efficacy of many of these prescriptions it may fairly be inferred arose mainly from the fact that their many ingredients had to be collected by the patients, when wandering about the fields.

In the time of James I., the unfortunate insane and epileptics were adjudged to be witches, the punishment for whom was nothing less than death. The belief in witchcraft extended in England from 1541 to 1736, when the laws against it were abolished. "The last judicial murder of a witch," says Dr. Tuke, "was in 1722."

The modes of punishment continued, however, were shocking, and in the language of our author, we may say:—

"That when the insane were no longer treated in monasteries, or brought to sacred wells, or flogged at 'trees of truth,' they fared no better—nay often, worse—when they were shut up in mad-houses, and crowded into work-houses. They were, too, often under the charge of brutal keepers, were chained to the wall or in their beds, where they lay in dirty straw, and frequently in the depth of winter

without a rag, to cover them. It is difficult to understand why and how they continued to live; why their care-takers did not, except in the case of profitable patients, kill them outright, and why failing this—which would have been a kindness compared with the prolonged tortures to which they were subjected—death did not come sooner to their relief."

In the second chapter of Dr. Tuke's book we find a detailed account of the origin of Bethlem and St. Luke's. Of the Bethlem of the time of Henry VIII. the title degenerated into Bedlam, or as it is now called the Bethlehem Royal Hospital. Those who only know this great Hospital at the present day with its magnificent arrangements and its grand income, cannot realize what it was fifty years after the death of Henry VIII., "so loathsome as to be unfit for any man to enter." The new Hospital opened in 1676 was the building in Moorsfield, and it was the first large asylum constructed in England for the sole object of providing for the insane.

No better illustration of the changed condition of the accommodations for the insane in England need be given, than a reference to the copies of prints in Mr. Gardner's collection, as given by Dr. Tuke, the one showing a room in Bethlem Hospital, about the year 1745, with the manacles on the patient, and so many of the painful surroundings, and opposite to it, the luxurious arrangements of one of the wards of the Bethlehem Hospital of the present day. The connection of the Munro family with this hospital is so remarkable as to be worthy of record. It continued from the service of Dr. James Munro, who was elected in 1728 and died in 1752, being succeeded by his son Dr. John Munro, who was attacked with paralysis in 1783, and who had his son Dr. Thomas Munro made his assistant in 1787, and who in 1792 was promoted to be chief physician to Bethlehem, retaining the office till 1816, when his son Dr. Edward Thomas Munro followed him.

The scene of Act III. of the drama of the Royal Hospital of Bethlehem belongs in St. George's Fields; the first stone was laid in 1812, and with a frontage of 594 feet, the building was opened in 1815, but the details of its arrangements were in no way creditable to those to whom had been entrusted the planning of the work, or to the general intelligence of the people of that period.

Owing to the insufficiency of Bethlem Hospital, St. Luke's was established in 1751 by private subscription, and it is worthy of mention that it was here that lectures on mental diseases were first delivered by Dr. Battie, the physician to the hospital, a new building being opened in 1787. Although St. Luke's never acquired the bad name of Bethlem, it was unquestionably far below what, at this day, could be regarded as even tolerable, in its early system of management of its patients.

The third chapter in referring to the eighteenth century asylums, embraces one of the most interesting periods of reform in the management of the insane, including as it does, the history of the foundation of the York Retreat, which with its subsequent management will always be regarded as a prominent feature in the great work which cannot fail to confer undying honour on all who were connected with it.

It was at this time that occurred the freeing of the violent insane from their fetters, at the Bicêtre,—the daring act which gave Pinel his grand title to honour, and which is not less referred to to-day than it was at the time it took place.

At this period William Tuke and his associates of the Society of Friends,

at York, England, had commenced their work not less assiduously or effectively but it was in a much quieter manner. By personal association they demonstrated the importance of treating the most unfortunate of their fellow-beings, as nearly as possible as they would wish to be treated themselves.

In connection with the great work done at York by William Tuke and his friends it may be mentioned in this place that in 1813 a history of the Retreat at York, an unpretending volume, which afterwards became most celebrated, was published by Samuel Tuke, a grandson of the originator of the mild system of treatment, which has just been referred to. In this volume, it may safely be said, will be found detailed substantially most of the principles of treatment which even now are generally recognized as being what all experience has shown to be the proper and successful ones for the management of the insane.

The fourth chapter of the work under notice is mainly made up of a continuation of the history of the exposures at the old York Asylum and various other institutions, and the effect of the mild treatment adopted at the Retreat, and made known by the many visitors to it, and the various writers on the subject. All these exerted a remarkable influence on subsequent legislation, which had been brought about by popular discussions, the appointment of select committees, their careful investigations, and the general circulation of their reports,—Sydney Smith, when writing for the *Edinburgh Review* in 1817, declaring that "the new establishment at York began the great revolution upon this subject."

It would probably have been better for the insane, if the results of the investigations referred to could now be forgotten, for in much that is written, at the present day, we find them referred to, as being illustrative of the present condition of even the most enlightened countries in regard to their treatment of the insane.

The last chapter alluded to closes with an acknowledgment of the great service rendered to the insane by Lord Shaftesbury during a period of more than fifty years, in devoting himself most intelligently to their best interests, and especially distinguishing himself as Chairman of the Lunacy Board since its formation.

In the fifth chapter we find an interesting history of the reform in the use of mechanical means of restraint, doing ample justice to the noted men who have been most active in securing its abolition, while at the same time giving a very fair *résumé* of the views of those who still believe a certain amount of it, under peculiar circumstances, is for the best interests of the patients. In this chapter, too, is a very just reference to the danger of substituting seclusion in place of mechanical restraint, and to its unfortunate tendencies.

The care of insane criminals—a subject of special interest everywhere—receives proper attention in the sixth chapter of Dr. Tuke's book. The State Criminal Asylum for England is at Broadmoor in Berkshire, four miles from the Bracknell Station and thirty miles from London. It was erected thirty years ago on a fine site, and embraces three hundred acres of land. Of late years escapes from it have been rare, from 1863 to 1877 there being only twenty-three, and during the last three years none. Broadmoor contains as many as five hundred patients, of whom four hundred are men and one hundred women. Dr. Tuke's description of Broadmoor and its whole history, as well as his suggestions in regard to this class of institutions, are exceedingly valuable, and show the interest

taken by the government in this particular institution. The want of such institutions is particularly felt in most of the United States, for nothing is more thoroughly settled, in the view of practical men, than the impropriety of admitting any of this class of patients into ordinary hospitals for the insane. This subject has been fully discussed by the American Association of Hospital Superintendents on many occasions, and there has never been any difference of sentiment in regard to the proper mode of giving care to this class, and the great harm done by their reception into the State hospitals that treat the insane from all positions in the community.

The chapter on Chancery Lunatics is interesting, and the public has seemed to feel specially familiar with their condition from the writings of Dickens and others. The Lord Chancellor's visitors, however, have done a most important work by their personal visitations, and their careful examinations of the manner in which such cases have been treated, not only in private establishments, but at their own homes. Among those who have laboured particularly to their advantage the distinguished Doctor Bucknill deserves special mention.

Attention is drawn in the following chapter to the unfortunate class of idiots and imbeciles, their past history, and various practical suggestions made in regard to what is due to them by the government, while full justice is done to the efforts of Sumner, Woodward, Backus, Howe, and others of our own countrymen.

The ninth chapter is devoted to the early history of the insane in Scotland, and their treatment, which up to a recent period had been of the most discreditable character. The important changes made in most of the Scotch institutions, however, it is only right to say, of late years have been so great as to give them at this time the highest character. The year 1855 proved to be the commencement of a new departure in the action of the government in making provision for the insane. Their condition at that time is represented by Dr. Tuke as being as bad as it could well be. It was at this period that an American lady, whose invaluable labours in her own country are everywhere recognized, visited Scotland, and the results of her work there—her "invasion of Scotland," as it was not inaptly styled by Dr. W. A. F. Browne—led to most important results. Opposed by officials in her investigations, she left the scene of her work, and, taking the night mail to London, she appeared before the Home Secretary on the following day, while the Edinburgh official was "still on the road, quite unconscious that the good lady had already traversed it." The statements made at this interview by Miss Dix produced the desired effect, and a royal commission was promptly appointed, while she was given every facility for making the most thorough investigation of every class of the insane in the country.

The tenth chapter gives a very clear description of the state of things in Ireland from the earliest period up to the present day. Although great improvements have been made, the Lunacy Inquiry Commission, as late as 1879, found in St. Patrick's Hospital a state of things utterly discreditable to the local authorities and far below the general requirements of the age. The efforts to secure abundant Parliamentary grants, so often failing as in England, are carefully detailed, and the ultimate provision is given as a valuable chapter of history, as are abstracts from the reports of the various commissions appointed to inquire into the condition of affairs throughout the country and to suggest remedies therefor.

The eleventh and last chapter is a most interesting record of the progress of psychological medicine during the forty years from 1841 to 1881, from the origin of the British Psychological Association up to the period of its meeting in the latter year, which terminated the service of our author as its presiding officer, and which was the occasion of the admirable address then delivered which forms this chapter. It is full of instruction, and cannot fail to be alluded to as authority on every subject to which it refers. We commend the whole volume which has passed under our notice to the careful perusal, not only of those who are specially devoted to psychological investigations, but to the members of the medical profession generally, who can hardly avoid being interested in the matters that are everywhere discussed with marked ability, and which cannot fail to add to the high character of its eminent author.

Dr. Tuke has the rare distinction of worthily inheriting a name than which for several generations none is better known for important labours in ameliorating the condition of the insane. In direct descent from William Tuke, the originator of the York Retreat, and more nearly connected with the Samuel Tuke to whom the world was indebted for the "description" of that institution so often alluded to, and the influence of which can hardly be overestimated, our author has distinguished himself in his life-work, as a hospital physician, and for his marked liberality, ability, and fairness as critic, editor, and author—the most prominent of his many writings being the Manual of Psychological Medicine, prepared by him in conjunction with the able Dr. Bucknill, and which has deservedly passed through several editions. T. S. K.

Art. XXI. — *The International Encyclopædia of Surgery: a Systematic Treatise on the Theory and Practice of Surgery, by Authors of various nations.* Edited by John Ashhurst, Jr., M.D. Vol. II. New York: William Wood & Co., 1882.

The second volume of this work in no way disappoints the expectations raised by the appearance of the first of the series under such favourable auspices. Although an international undertaking, it is none the less a most interesting event in the history of American surgical literature.

The volume opens with a short article on Contusions, by Dr. Hunter McGuire. The article on Wounds is by a writer well known in this country, Mr. Bryant, the author of the work on surgery. After some general remarks on the different kinds of wounds, the process of repair is considered; but this portion of the subject is, as one might expect in a surgeon more at home with the practical part of surgery, somewhat briefly handled. The views on cell action here expressed are chiefly borrowed from Golding Bird, a writer who is, perhaps, not so generally accepted as an authority on this subject as many others who might have been chosen. This subject is dismissed with a few remarks on the repair of muscles and nerves, illustrated by familiar woodcuts from Billroth. Although as much has been said as could appropriately be in a short article on wounds, we cannot help thinking that so important a department of sur-

gical pathology might well have received more attention in a work of the dimensions of the Encyclopædia.

Approaching the question of treatment, we soon discover that the author is unwilling to concede that position to the doctrines of Lister which so many surgeons now accord to them. Although recognizing the value of various antiseptic lotions for purifying wound surfaces, he has little faith in the action of atmospheric germs as promotive of inflammation and suppuration. In speaking of the contrast between the action of open and subcutaneous wounds he says:—

"What there is in the air that makes this wide difference is now, as it ever has been, open to argument; and whether it is the stimulating or chemical influence of the oxygen, the irritating influence of atmospheric germs, the length of time the part is exposed, rather than the mere fact of exposure or some other cause, may be subject to dispute."

Of the views of antiseptic surgeons and the results obtained by them, he boldly affirms, "that an enormous superstructure has been raised by the ingenuity of its builders upon a narrow foundation, and that good results have been too hastily attributed to causes which have been but semi-factors of a work to which others equally potent for good have, without doubt, contributed." He, however, pays a tribute "to the name of Lister for having helped, more than any one else, to establish the value of antiseptic drugs and antiseptic precautions in the practice of surgery all over the world." We shall see presently, in the following article, that this is a position which Mr. Lister's pupil quite positively disclaims for his master. The particular kind of dressing on which Mr. Bryant pins his faith is that which he styles antiseptic irrigation of wounds, and consists in the washing out of all wounds, whether fresh or old, abscess or sinus, with a lotion of iodine, made by adding twenty drops of the tincture to the ounce of water. The subsequent dressing consists of either dry absorbent lint or lint soaked in a mixture of terebene and oil. Drainage tubes are an important feature of his method. In wounds of the face he very properly recommends no dressing whatever, and expresses strong disapproval of wet applications to wounds of any kind.

The special modes of treating wounds, such as by occlusion, the cotton dressing, the open treatment, the earth dressing, all receive the due share of the attention of the author; but the antiseptic method is reserved for Mr. Watson Cheyne in the following chapter. Here we find a summary of the work which has recently been published by this writer, and we strongly recommend it to the careful perusal of all surgeons who desire to learn the principles upon which Mr. Lister's system is based, and wherein it differs from the antiseptic treatment of those surgeons who, like Mr. Bryant, maintain that they are applying the same principle as Mr. Lister, without his cumbersome methods. The studies of Pasteur and others having shown that putrefaction, like other forms of fermentation, was due to the growth of a micro-organism derived from the outer world, it occurred to Mr. Lister that fermentation might be prevented in the discharges from wounds by destroying through certain agencies the fermenting powers of these particles *before* they reach the wound. The most common way in which antiseptics are employed is by permitting the entrance of organisms into the wound, and neutralizing their power afterwards. The antiseptic is added to the discharge with the intention of neutralizing the growth of the organism; when this substance, like carbolic acid, irritates the wound, it in a measure defeats the object for which it

was intended by increasing the discharge. The drainage tube and the water bath are antiseptic, in that they conduct off the discharge; so also is the open-air treatment, for Pasteur has shown that the fermenting power of the organism is much diminished by a free supply of oxygen, and the discharge becomes concentrated by evaporation, and thus less suited for the development of bacteria. But these all differ from the great principle laid down by Lister, which aims at excluding the causes of fermentation altogether from the wound, and to which he gives the name of the *aseptic* method. The cry raised, when Mr. Lister changes any of the details of his dressing, that "Listerism is dead," rests on a misunderstanding of what Listerism is. The time may indeed come when the present dressing may be entirely changed, but the predominant principle of wound treatment "which is now a law of the first importance to the practical surgeon," will, it is claimed, and we think with justice, always remain.

The remaining portion of the article is devoted to a detailed description of the application of the aseptic method to operations and to the dressing of wounds. It is a point worthy of notice that Mr. Cheyne regards the spray as the least essential of all the details of the Listerian method; that he considers it as a convenience and not a necessity. The most essential part of the treatment is, he thinks, the thorough purification of everything which comes in contact with the wound. There are many details to be found in this article which are not easy to get hold of elsewhere, and make it exceedingly valuable to surgeons who practise this method. It is, moreover, the first official statement, if the term may be used, that has appeared in a general work on surgery.

A five years' experience with this system, although it has not carried us quite as far as some of the disciples of Lister go, has placed us among those who would return with great dissatisfaction to the methods prevailing in this country before the introduction of the aseptic method. While it does not seem possible in a hospital service to attain that high ideal which the great expounder of the system would exact, the method seems well adapted to ward off the particular class of dangers which such a service involves.

The chapter on poisoned wounds is contributed by Dr. John H. Packard, and includes dissecting wounds, insect-, and snake-bites; a number of cases, some of which have come under the writer's own observation, give special value and interest to the article.

An attractive feature of this part of the work is a short but exceedingly interesting article on sabre, bayonet, and arrow wounds, by Dr. T. H. Bill, surgeon and brevet lieutenant-colonel U. S. A. The greater portion of it is devoted to arrow-wounds, with which the writer appears to have had considerable experience. As surgeons rarely have an opportunity to see injuries of this kind, the facts reported are sure to be both novel and interesting to the writer. For instance, few are aware that the arrow is a most deadly weapon. "Its silence, its penetration, the difficulty with which it is recovered, the rapidity with which it is discharged, and its correctness of flight, confer upon it the highest deadliness." Moreover, the author states that "the arrow can be aimed at fifty yards as correctly as a revolver, and can be shot nearly as fast," and that an expert archer will deliver as many as six arrows in a minute. The abdomen is the most vulnerable portion of the body, it appears, and with the Indian this is the "point of election;" while the Mexican protects this part with special care by covering it with many folds of a blanket. In the removal of this

missile the greatest precautions are to be employed to prevent the separation of the head from the shaft, to which it is usually attached by a thong of hide. The lodgment of the head will almost inevitably produce fatal mischief. The author says:—

"If I should undertake such an operation, I would make up my mind to find the arrowhead, even if it became necessary to tear up every fasciculus of every muscle of the injured member."

If possible, the head of the arrow may be pushed onward in its course until it reaches the integument, in which position it is easily removed, and the shaft subsequently withdrawn through the wound of entrance. If an attempt be made to extract the head through the wound of entrance no traction should be made on the shaft, but using the latter as a guide, and enlarging freely the wound, some form of instrument must be attached to the head in order to secure it successfully. The author gives a drawing of forceps with claw-like jaws so arranged as to encircle the head, the joint being made like that of dentists' forceps so as to allow of any amount of twisting without bending—a wire loop may be passed down over the shaft and twisted into the head. The latter is sometimes so firmly embedded in bone as to require nearly the amount of force exerted in the extraction of a tooth to loosen it. When once removed, healing of the wound by first intention may be encouraged by the surgeon.

Gunshot wounds are treated by Dr. P. S. Conover, who has taken advantage of the superb materials at his command to make this chapter a valuable feature of the volume. From a glance at these pages it is evident that the surgical history of our war still continues to afford the bulk of material which has advanced so considerably later writings upon this branch of surgery. Data from the Franco-German war are beginning to appear, but we presume that the present generation will not receive again so important a contribution to military surgery—always excepting the last volume of our national work, which has not yet appeared. There are, however, many additions to the surgery of the time of our war, and these our author, we are glad to see, has duly recorded. The value of the record of temperature in shock from gunshot injury, and particularly in wounds of the abdominal cavity, is properly estimated. On the other hand, we no not find that clearness of definition of the terms septicæmia and pyæmia which we could wish to find. Parotitis, we notice, is regarded as a septicæmic symptom in contradistinction to the views of some writers who place it among the pyæmic processes. In discussing the treatment of gunshot wounds of the abdomen those who read with interest the valuable article of Dr. Marion Sims will be glad to hear the writer express the opinion that:—

"The experience of the last twenty years has clearly demonstrated that the laying open of the peritoneum is not as dangerous as had previously been thought. . . . Whenever the symptoms clearly indicate that extensive bleeding has recently occurred, or is still taking place; or that there has been an intra-peritoneal extravasation of urine or of bile—it certainly seems to be proper, and the surgeon's duty to perform laparotomy, turn out all clots, tie such undivided vessels as can be found, sew up the opening or openings in the intestinal tube, thoroughly cleanse the cavity, and provide for the ready outflow of any fluid that may afterwards be poured out."

In this direction lies the most obvious road to improvement in this department of surgery: it remains for time and experience to decide whether

we shall here find a permanent and important addition to our surgical knowledge.

To those who have felt that the injury to our late President was more completely under the control of modern science than the result proved, it may be a consolation to learn that had he lived, the injury to the vertebræ might have been accompanied by "more or less serious disturbance (pain, weakness, or positive paralysis), usually remaining during the after life of the individual, with perhaps caries and abscess, or fistulæ, communicating with dead bone." Recovery may, however, take place with very little after disturbance, but this is generally in youngish subjects. These statements are interesting in connection with the assertion of Esmarch, that wounds of this order are frequently recovered from. The criticisms of this distinguished surgeon on the antiseptic character of the treatment adopted in the case of President Garfield, although emphasized by many statements which will not bear a cross-examination, will, we hope, help to draw attention to what may eventually become a radical change in the treatment of gunshot injuries. It must be acknowledged even by those who have not adopted the principles of Lister, that the traditional method of dealing with shot injuries; the search for the ball with probe and finger as ordinarily performed, cannot be reconciled with antiseptic treatment, however liberally interpreted. The complicated preparations of spray and other accompaniments cannot of course be obtained on the battle-field, but surely the demand for "the thorough purification of everything (hands, instruments, etc.) which comes in contact with the wound" (see page 75) is not an unreasonable one. The recognition of views now freely advanced, that the presence of the bullet in a wound is not necessarily an element of danger, and that it is of the greatest importance to avoid an examination until it is possible to leave the wound in a condition the most favourable for healing, will, if they are confirmed by experience, have distinctly advanced our knowledge of the treatment of gunshot wounds.

The Effects of Heat, is the title of a chapter on burns by Dr. Thomas George Morton. The article very appropriately opens with some account of the varieties of accidents which give rise to this form of injury. When we learn from the daily press that, during the eleven months of 1882, among the buildings destroyed by fire, there were 362 hotels, 99 churches, 62 school-houses, 20 court-houses, 14 asylums, 13 college buildings, 7 hospitals, 6 almshouses, 2 custom-houses: total, 585—a property valued at ninety millions of dollars—we may gain some idea of the importance of which injuries from these causes are bound to assume in the surgery of to-day. An essay which dealt with the prevention rather than the cure of this class of surgical affections, would doubtless prove far more interesting reading, as our knowledge of the treatment of burns has made no essential progress of late years. Dr. Morton has, however, succeeded in giving a flavour of originality to his work, and has, indeed, under the head of "prophylaxis," called attention to some of our national weaknesses, for which we pay so severe penalties. The association of albuminuria with febrile disturbance, after burning, is made the subject of special study, which is illustrated by a number of interesting charts and cases, and forms the most striking feature of this article. A section on sunburns finds a most appropriate place here, and the cases reported should serve as a warning to young men who are ambitious to "pose" as boating "swells" of the period. We could add to the cases quoted one which occurred in the person of an old sailor, who was making his first trip of

the season in a summer yacht. The œdematous swelling of the backs of both hands was intensely painful, but was promptly relieved by irrigation applied at the hospital to which he was transferred.

The various applications for the treatment are mentioned with due discretion, and careful directions are given in case of burns from acids or alkalies.

The Effects of Cold, is the title of an article by Dr. J. A. Grant, of Ottowa.

It is customary, in most English surgical works, to give a special chapter to "abscess," but it has always seemed to us a very unscientific and somewhat misleading plan. Abscess is but a sequel of pre-existing disease, and would more appropriately be dealt with incidentally to inflammations of the cellular tissue, bone, or other structures, where it is liable to occur. There are, however, certain features common to abscesses which can be considered separately to advantage, but the subject should be placed in close proximity at least to some cognate subject. To Mr. Howard Marsh, of St. Bartholomew's Hospital, this chapter has been entrusted. The relation of germs to abscesses; their presence or absence under varying circumstances is a question which has excited considerable attention, but which we fail to find mentioned. Some of the peculiarities of abscess alluded to in the text, may possibly be explained by a study of this relation, such as residual abscesses, or those formed in or about the residues of former inflammation, when the presence of permanent germs or spores might, after long quiescence, suddenly under favourable conditions awaken the inflammatory process. The diagnosis of abscess is, perhaps, one of the best features of the article. Another valuable feature is the citation of cases in condensed form, illustrative of the text. The late Dr. John T. Hodgen had fortunately completed his article on ulcers, which will prove a source of melancholy interest to his many friends. The most notable feature is the high praise awarded to Dr. Martin's method of treating ulcers with the elastic bandage.

Dr. E. M. Moore, of the University of Buffalo, follows with an article on gangrene and gangrenous diseases, which include also furuncle and carbuncle. The space allowed for these subjects is but a meagre one, and the author has apparently been forced to confine himself to the more practical features of his task. The pathological part has suffered in consequence. This is, indeed, a criticism which might hold of most that has been written for the first two volumes of this work. The demand "for practical treatises" may still continue, but we have no fear ourselves that a little more science would hurt the American medical reader. The different varieties of gangrene are carefully noted. One which we do not remember before to have seen in an English text-book is symmetrical gangrene. Some account of Dr. Maurice Reynaud's article on that subject, to be found in the *Nouveau Dictionnaire*, would have been a very valuable addition to this section. The rules for treatment are almost without exception excellent, and the plates which illustrate the article are beautiful specimens of the chromo-lithograph.

Venereal diseases are at the present time so completely separated from general surgery, and have become so exclusively the property of a specialty, that they rarely figure as a feature of a course of lectures on surgery. They are still retained in works on surgery for the same reasons, probably, that chapters on the eye and ear continue to appear. The general reader is not supposed to be satisfied, unless all the ground is covered that does not come strictly under the head of medicine or midwifery. It has been

said that, leave out the specialties, and there is little left of surgery but fractures and amputations, but he who has to write the book will find that, with our increase of knowledge, the field will still be as large as ever. It would hardly be judicious to omit this subject entirely from a great treatise like the present one, but we are not prepared to acquiesce in so large an appropriation of space, over one-third of the volume, to this department. Our sense of proportion is somewhat jarred in comparing the length of the article on so important a feature of pure surgery as gangrene with that on gonorrhœa; the former containing thirty pages, the latter eighty pages. The author of this article is Dr. J. William White, of Philadelphia, who combines a considerable experience with a very complete knowledge of the literature of this subject. We may say the same of the chapter on the chancroid, by Dr. F. R. Sturgis, of New York, and that on syphilis by Dr. Van Harlingen, of Philadelphia. They are important contributions to the literature of this specialty, and deserve a separate and extended review.

It might be supposed that similar criticisms could be applied to the article on Diseases of the Skin, by Dr. James C. White; but the writer has seen fit to limit himself exclusively to those diseases in which treatment by some form of operative procedure is sometimes called for, and in this respect alone it seems to us to possess a great advantage over similar chapters in other works. It contains precisely the kind of information which the surgeon wishes to obtain, and thus establishes its right to a place in a work on surgery. The strength of the chapter lies, however, as one might expect, in those portions chiefly which belong in the domain of the dermatologist rather than the surgeon. It opens with an account of the affections of the sebaceous glands, which is followed by inflammations of the skin produced by poisonous substances, and a table of such medicinal substances as are followed by eruptions. A valuable note is added on the erythematous eruptions which follow surgical operations. Eczema, of course, finds a place here, and has a somewhat more extended notice. Under the hypertrophies we find a section on the epidermic crusts familiar in the faces of old people, and known to those learned in dermatological lore as keratosis senilis. Although strictly belonging under this head, their frequent association with cancerous affections of the face might suggest a closer proximity in the text. Under diseases of nail the surgeon will recognize an old friend in ingrowing toe-nail, which is of course necessarily introduced here, although it seems a little startling to find him in the camp of the specialist. Under diseases of the hair, it is pleasant to record a distinct advance in the treatment of hirsuties, namely, the method of electrolysis introduced by Dr. Michel, which, although illustrating painfully the old French adage, "*Il faut souffrir pour être belle*," will nevertheless be hailed by the female sex as an unquestionable boon. The section on leprosy, elephantiasis, and lupus are among the best of this chapter, and with the concluding remarks on parasitic affections show the ability of the writer to the greatest advantage. One regrets only that the exigencies of the occasion have confined him to so limited a space. We venture, however, one word of criticism. The writer, a disciple of Hebra, has seen fit to quote chiefly from the writings of the present exponent of the Vienna school, and in so doing has hardly done full justice to the work of his own countrymen.

We come now to diseases of tissues, and first of all the cellular tissue, a subject which is briefly, but well handled by Dr. Joseph W. Howe, of

New York. Although we are not prepared to accept his classification, yet the more important forms of inflammation of this tissue are clearly described. This is a department which needs careful handling, for although an exceedingly common disease, its pathology is not usually clearly laid down in the books, and much confusion of ideas and nomenclature exists in consequence among surgeons. This is particularly true of the diffuse forms of cellulitis which are often confounded with phlegmonous erysipelas. For this reason we should prefer the French division into diffuse and circumscribed cellulitis. The article on abscess could, as we have said, be more appropriately placed after this chapter than where it is, earlier in the volume, for abscess is but a sequel of inflammation of the connective tissue, and not, as many of us have been taught, an entity by itself to be regarded in the light of an independent disease.

Dr. Nancrede's article on Injuries and Diseases of the Bursæ, which closes this volume, is a particularly satisfactory one to the critic's eye. He is not slovenly about his pathology, nor is he to be caught napping on his literature—as for his anatomy—well, the less we acknowledge our previous ignorance the better! The reader need not fear that this is not a "practical" article for his views on treatment, as, for instance, the management of deformities of the toes and their sequels are thoroughly sound. The concluding pages are devoted to perforating ulcer, which, by the way, is also mentioned by Dr. J. C. White. Dr. Nancrede recognizes several varieties, specimens of which we remember to have seen several examples, but the pure *mal perforant* we have never seen in this country, *i. e.*, the typical forms described by French writers, and seen so frequently in French hospitals.

In giving a general estimate of this volume, we must say that, although the standard of the first volume is well sustained, the individual articles appear to have been curtailed for want of space. As a companion to Ziemssen's Cyclopædia, it will suffer in this respect by comparison; as it will also with the great German Surgeries or the Nouveau Dictionnaire, but as a book of reference for the practitioner, it will, of course, be better adapted than any of these. The great preponderance of American authors is an indication of the capacity of the profession in this country to produce a work on this scale, quite independently of foreign aid. The publishers' work is done in a style equalled in few American medical books. J. C. W.

ART. XXII.—*The Physiology and Pathology of the Blood: comprising the Origin, Mode of Development, Pathological and Post-mortem Changes of its Morphological Elements in Mammals and Oviparous Vertebrates.* By RICHARD NORRIS, M.D., F.R.S.E., Professor of Physiology, Queen's College, Birmingham; Vice-President of the Birmingham Philosophical Society. With Microphotographic Illustrations. 8vo., pp. xiv. 274. London: Smith, Elder & Co., 1882.

Dr. Norris's Third Corpuscle of the Blood. A Criticism and Refutation. By Mrs. ERNEST HART. Pamphlet, 12mo., pp. 12. Reprinted from the London Medical Record, of Oct. 15, 1882.

FAMILIAR as is the chemical and structural composition of the blood to most of us, the question of the origin and formation of its red corpuscular

elements cannot be considered as demonstrated to the satisfaction of more than a very few, if to any. Any publication, therefore, be it volume or pamphlet, which promises to give us the light we seek, will be eagerly read by all inquiring physicians. Dr. Norris's book should, therefore, have many readers. As to whether these will be convinced by the facts and reasoning adduced, we will not anticipate opinion.

First. Dr. Norris claims to have discovered, as early as 1877, in the blood of mammals a large number of corpuscles of the same colour and same refractive index as the liquor sanguinis, and which are, therefore, invisible in that menstruum. This new corpuscle, which he calls the third corpuscle, he succeeded in photographing with high powers, and its existence may, therefore, be considered undoubted. His researches were first published Nov. 14, 1878, and he claims, therefore, to have anticipated the discovery of the same element by Bizzozero, who first published his paper "On a New Element of Mammalian Blood and the part it plays in the Production of Thrombi and Coagulation Generally," Jan. 14, 1882. From a careful comparison of the text of both observers, conveniently arranged by Dr. N. for such comparison, it appears to us that this point is well sustained—that Dr. Norris did anticipate the Italian investigator in the discovery of the invisible corpuscle, although there is nothing to show that the latter was at all aware of Dr. Norris's discovery.

Unquestionably, also, Dr. Norris has succeeded in photographing certain corpuscles of the blood, which, under the same circumstances, are invisible to the eye aided by the microscope. Now there can be only three views taken as to the nature of these corpuscles. Either they are the ordinary red disks of the blood which have become decolorized, or they are red disks which have lost their colour as a preliminary towards dissolution, or they represent a stage of the existence of these disks in which they have not attained a degree of colour sufficient to make them visible. The latter view is the one taken by Dr. Norris, to the proof of which a large part of his book is devoted; the first is the view of Mrs. Ernest Hart, the object of whose pamphlet is to refute the position of Dr. Norris. Dr. Norris, assuming that these represent an earlier uncoloured stage in the life of the red disk, proceeds to account for them, and to lay down a theory of evolution for the red blood disks which seems quite consistent with his premises. He also suggests a theory of leucæmia and another of anæmia. We will, however, chiefly confine ourselves to a study of the evidence he offers in favour of his principal proposition, that there is a third invisible corpuscle in the blood; and as Mrs. Hart's object is to refute such evidence, we will, at the same time, consider the weight of her objections.

Against the view that they are red corpuscles which have lost their hæmoglobin in the brief interval (a few seconds) between the shedding of the blood and its examination, Dr. Norris says it may be urged—

"1st. That they are obtained in greatest perfection when those measures are adopted which tend to preserve the blood from change, *i. e.*, cold or osmic acid. 2d. They may be seen immediately the preparation is made (packing method), and before the liquor sanguinis has become stained, and they do not increase in number as time elapses. 3d. Assuming the red corpuscles to lose hæmoglobin, the loss must occur in such a manner as to furnish corpuscles exhibiting all gradations between a *colourless* and a *full red* biconcave disk. If, therefore, we start with the idea that the corpuscles originally are all coloured, their decolorization *in this graduated manner* would of itself indicate a difference in nature. 4th. If a three-quarter per cent. solution of salt be saturated with hæmoglobin, and a drop of this be placed upon the end of the finger, and the latter be pricked

through the drop so that the blood may come at once into contact with fluid *saturated with hæmoglobin*, the colourless disks are still present as usual. It is obvious that these are not conditions favourable to the yielding up of the colouring matter. 5th. When first brought into view by the method of altering the refractive index of the liquor sanguinis, many of these corpuscles are of a pure white colour, but they gradually become stained by the hæmoglobin discharged by the red corpuscles. It is impossible to suppose that they first yield up the *whole* of their colouring matter, and then subsequently take it up again. 6th, finally. The general behaviour of these corpuscles after the blood is shed, their tendency to break up into granules, to lay themselves down as delicate films, to form networks; in a word, their fibrin-forming property is totally opposed to the conception that they were once red disks.

"The second conjecture that they are red disks which have lost their colour as a preliminary step towards dissolution, has no facts to lend it support, while it is easy to show the existence in the blood of dark red granules, to which it is difficult to attach a meaning, unless we regard them as red corpuscles undergoing disintegration. These often occur in masses, but the same disintegrating actions may be traced in single corpuscles."

The "packing" method alluded to, consists in selecting a thin glass cover, which is slightly convex, placing it with its more convex surface upon a glass slide, and strapping it there so firmly as to produce a series of Newton's rings of an elongated form. A drop of blood is placed at the edge of the cover, and the corpuscles are drawn in by capillary attraction until they reach a spot they cannot pass in consequence of the proximity of the two surfaces, whilst the liquor sanguinis has free passage. Dr. Norris claims that the corpuscles are not compressed by this treatment, while Mrs. Hart insists that they are, as it seems to us is evident upon a little consideration. The blood disk is very soft and pliant, as is well known to any one who has seen the bending which a red disk undergoes in its contact with resistance in its own current, and doubtless this same property permits it to become thinner and thinner, as it is drawn in between the two glasses. This compression favours the extrusion of its hæmoglobin, as is admitted by Dr. Norris on page 52, although he denies it on page 47. He admits, pages 49 and 51, that the corpuscles in this way may become barely visible, and even invisible, not because they are actually colourless, but because the liquor sanguinis has become coloured to a like intensity with themselves. This inconsistency Mrs. Hart points out. Such extrusion being admitted, it is impossible to deny that the colourless disks are really the ordinary red blood disks discolourized, although it may be almost as difficult to prove that they are. Still it would seem that the burden of proof rests with Dr. Norris.

That they are obtained in the greatest perfection when treated with osmic acid, Mrs. Hart also denies. It is true that a two per cent. solution of osmic acid fixes albuminoid bodies like the red blood disks, but in order that it may do this, the solution must remain of the same strength, and be brought into immediate contact with the corpuscles. Mrs. Hart contends that in Dr. Norris's method of treatment the solution of osmic acid is diluted by the serum of the blood, and, therefore, does not fix the corpuscles. She describes a method of her own, in which the treatment by osmic acid failed to develop the invisible corpuscles. Dr. Norris claims to have repeated this process with the opposite result, finding the colourless disks present in abundance. Here, of course, is a question of accuracy of observation, which must be determined by a third party. But in a more recent experiment Mrs. Hart placed two large drops of the two per cent. solution of osmic acid in a watch-glass, and into this

squeezed a small drop of blood and stirred rapidly with a glass rod; from this mixture were taken, at intervals of one, ten, and twenty minutes, small drops which were run under mica covers for examination. In all except the first specimen, the liquor sanguinis remained perfectly clear and colourless, and the corpuscles packed beautifully. *Not a trace, however, of the invisible corpuscles could be found*, though she sought for them most diligently. At the end of twenty minutes the mixture was diluted with a fluidrachm of water, with the object of changing the refractive index of the serum, after the corpuscles had been fully fixed. Careful examination of this solution *failed to discover a single invisible* corpuscle, even though the staining reagents, which bring into view the disks rendered quite invisible by the action of water, were added to the solution. If this observation is correct, it effectually destroys the force of Dr. Norris's second reason, and proves the correctness of Mrs. Hart's proposition.

So, also, Mrs. Hart criticizes Dr. N.'s treatment of the corpuscles with absolute alcohol, showing that he does not secure the action of absolute alcohol, but of dilute alcohol, which causes the corpuscles to discharge their hæmoglobin and to become transparent.

Again, she shows that the effect of a three-fourths of one per cent. solution of common salt—used by Dr. Norris to develop his invisible corpuscles—is to cause a certain number of the ordinary red disks to become invisible, about three per cent., although "this figure would doubtless vary with the health and age of the subject of the experiment." Dr. Norris puts down the invisible corpuscles as one in sixty, which is much less than he obtained by treating the blood with a saturated solution of salt used in his earlier experiments, and published in his first paper. The substitution of the more dilute solution Mrs. Hart claims to be the result of an earlier criticism of hers, although Dr. N. makes no allusion in his recent work to such change.

Finally, Mrs. Hart repeats Dr. Norris's experiment of mixing the blood with a soluble colloid, such as albumen or gum (by means of which he considers that the hæmoglobin is prevented from escaping from the corpuscle), and then allowing this mixture to run under thin mica covers. Dr. Norris says that the invisible corpuscle will then be found to be present. But again she fails to find the invisible corpuscle so long as the liquor sanguinis remains untinted, but it appears as usual when the hæmoglobin begins to be effused from the corpuscles. She calls attention to a photograph (No. 52) in Dr. Norris's book, taken from blood thus treated, in which he says "the invisible corpuscle is present as usual." We quite agree with her that "it would be difficult for an unbiased person to detect in it the presence of a single colourless corpuscle," meaning, of course, the "invisible" or "colourless disk" so often referred to.

Now, if it is shown that by a single method of treatment which admittedly fixes the blood-corpuscles in the condition in which they are at the moment they leave the bloodvessels, these invisible disks are not present; and that, on the other hand, their appearance is brought about by a treatment which favours a change in the physical condition of the blood-corpuscles, the whole theory of their existence falls. And this seems to us the inevitable conclusion to which the experiments of Mrs. Hart lead us. The researches of Dr. Norris are very painstaking and laborious, but they seem to us to fail in their object.

It remains only to mention briefly Dr. Norris's views on the remaining

matters connected with blood formation, on leukæmia and anæmia. He holds that there are in the lymph two kinds of lymph corpuscles, which are really *disks*, smaller, but somewhat thicker than the blood disks. These he indicates as *primary* and *advanced* lymph disks. The latter are the free nuclei of the former, and, in the main, enter the blood in such a forward state of development, as to become at once the smooth *invisible* colourless disks; but a few less perfectly elaborated present themselves in the blood as very delicate, translucent, *visible* disks, free from hæmoglobin, which, however, gradually pass into the invisible state. The shedding of the protoplasm which converts the primary into the advanced lymph disks takes place on the lymphatic gland, or the thoracic duct, whence they are poured into the blood in large numbers. They gradually become coloured by the endogenous secretion of hæmoglobin, and thus become the ordinary visible red blood disks. A few of the primary disks escape this decapsulation in the blood glands and pass over into the blood more visible than the advanced lymph disks and slightly larger in size. They do not pass into the invisible state, but undergo development into the *uninuclear white corpuscle*. These develop, by divisions of the nuclei, into the *multinuclear white corpuscle*. The nuclei of this corpuscle again may become free, become invisible disks, and subsequently red disks. The accidentally visible element of the "fugitive group" of invisible disks, is the corpuscle seen in the circulating blood by Bizzozero. "Its existence is but the indication of the presence of a far more numerous series of corpuscles which are wholly invisible to the naked eye, but some of which are, nevertheless, capable of being photographed."

So, too, he considers that the "hæmatoblasts" of Hayem are nothing but granular fragments of broken-down, invisible disks. In the invisible disks also exist the elements which are essential to the formation of fibrin and the coagulation of the blood, fibrinogen, fibrinoplastin, and fibrin ferment. The fibrin, which forms in the *lymph*, is a product of the *advanced lymph disks*, while the ordinary clot, which forms in *blood* in a state of dequiescence, is formed entirely of these and the invisible corpuscles.

With regard to the office of the bone-marrow, as a blood-making organ, Dr. Norris says:—

"As a lymphoid organ, the bone-marrow possesses special characteristics, which distinguish it from the spleen, lymphatics, thymus, etc., in the fact that, at an early period of embryo life, its colourless nucleated elements develop, *in situ*, into red nucleated cells, and that, at a more advanced period, these undergo conversion into, or give rise to red disks; but even in the embryo, side by side with this mode, a new method for the formation of red disks is set up, which consists in the *colouration of naked nuclei*, which have been set free from the colourless cells of the marrow. This differs only from the general mode of blood formation I have described, in the fact that colour is obtained in some instances before the nuclei leaves the marrow, instead of after they have entered the blood. These embryonic modes of blood formation persist in some of the lower mammals throughout life, alongside the numerically far more important modes, in which free nuclear disks leave the marrow and enter the blood in a colourless state. In the higher mammals the bone-marrow at birth ceases almost entirely to produce disks by means of red nucleated cells, and, in common with the other lymphoid organs, transmits to the blood naked nuclei, or advanced lymph disks, which, passing through the invisible stage, reappears as pale, red disks, and ultimately becomes fully coloured. It is, of course, possible that, under some conditions, embryonic modes may be reverted to, and in such cases even the bone-marrow of higher mammals might be found to again produce red disks from red nucleated cells. These are not, however, its normal condition." (Pages 195, 196.)

According to Dr. Norris it is the nucleolus of the nucleated red cell of the bone-marrow which becomes the red disk, being freed by the consecutive disintegration of the cell-wall, the nucleus, and the envelope of the nucleolus.

Dr. Norris considers the colourless ellipsoids of the ovipara to be the analogues of the advanced lymph disks of the mammal, being transmitted to the blood like the latter in a colourless state to obtain their hæmoglobin in the circulation.

Leukæmia, according to Dr. Norris, is due to a hyperæmia and hyperplasia of lymphoid organs, as the result of which the lymph corpuscles are not retained long enough to permit the decapsulation of the primary lymph disk, and the setting free of its nucleus as the advanced or invisible disk. Hence, nucleated white corpuscles pass over into the blood in large numbers.

Anæmia, according to Dr. Norris, is the result of a diminished vitality of the lymph disks, which leads to a reduction of their life period, and consequent decrease in their numbers. As the hæmoglobin is gained gradually in the blood, equal increments in equal times, there must be a decrease of hæmoglobin disproportionate to that of the number of corpuscles shown by experiment to be as three to two. This explains the typical variety of anæmia. But the vitality of the corpuscle may be differently affected, impairing the normal rate of the hæmoglobin-producing function, so that the proportion of this coloring matter is reduced below that proper to the number of corpuscles present in the typical form of anæmia; or the vitality may be still differently influenced, as the result of which the disk-producing power of the lymphoid organs is diminished, still further reducing the number of corpuscles, and resulting in the conditions known as pernicious or essential anæmia. These are, of course, theories which are not demonstrated, but they are at least as plausible as any others which have been suggested in connection with these subjects. Mrs. Hart suggests that the theory of anæmia does not explain those cases of pernicious anæmia in which the number of corpuscles is enormously diminished, but the proportion of hæmoglobin per corpuscle is above the average.

J. T.

ART. XXIII.—*A Dictionary of Medicine, including General Pathology, General Therapeutics, Hygiene, and the Diseases peculiar to Women and Children.* By various writers. Edited by RICHARD QUAIN, M.D., F.R.S. 8vo. pp. 1816. New York: D. Appleton & Co., 1883.

IN a work of such proportions as this volume of 1816 pages of fine type, it is impossible for a reviewer to attempt thorough criticism in a limited space. Any selection of articles must seem invidious, because the reader cannot fail to acknowledge such a general excellence as will leave little room for adverse criticism. All the articles are concise and yet are comprehensive enough to be satisfactory. These characteristics are best shown by the care bestowed upon subjects which have received but cursory notice in some of the encyclopædias which comprise many volumes. For instance, Enlargement of the Bronchial Glands, is treated by Dr. Quain. He comments upon the symptomatology under eleven heads. 1. Cough;

2. Pain; 3. Difficulty of Breathing; 4. Difficulty of Swallowing; 5. Congestion of Face; 6. Hæmoptysis; 7. Expectoration of Mucus; 8. Loss of Voice; 9. Vomiting; 10. Relief afforded by Change of Posture; 11. Physical Signs. Enlargement of the Bronchial Glands as a cause of reflex excitement of the Vagus, is considered in the same article, and also in that on Pertussis, by W. Squire. Besides, there is a very interesting article entitled Diseases of the Pneumogastric Nerve, by W. R. Gowers. The same detail is observed by J. Risdon Bennett, in his paper on Mediastinal Growths and Malignant Disease of the Lungs. But this attention to detail is perhaps carried to an extreme in the consideration of Diseases of the Heart. For instance, Dr. Bruce describes Fibroid Disease of the Heart, also Congestion of the Heart with increase of Connective Tissue, while Dr. Quain considers the subject of Connective Tissue, Hypertrophy of the Heart. Balthazar Foster supplies an excellent article on Valvular Heart Disease, and Bristowe considers Cardiac Dilatation and Cardiac Hypertrophy. In addition we find an interesting sketch of Malformations of the Heart, by T. B. Peacock. The perspicuity of the subject would have been increased if the fifty pages devoted to it could have been penned by fewer hands. Thomas Hayden and T. Holmes consider the subject of Aneurism. The articles on Contagion, by John Simon; Germs of Disease, by H. C. Bastian; Zyme and Bacilli, by Victor Horsley; Micrococci and Malignant Pustule, by Greenfield, are all very comprehensive and thoroughly abreast with modern views. Even the Bacilli of Koch receive due attention. But after reading all of them one is tempted to feel that ultimate truth on this subject has not yet been reached, perhaps not beyond the—

"little pitted speck in garnered fruit,
Which, rotting inward, slowly moulders all."

A valuable contribution is made by Chas. S. Roy on the Nucleus of Cells, especially in relation to cell proliferation. Eighteen pages are reserved for Renal Disease, the subject having been given to T. Grainger Stewart. He has classified Bright's Diseases as Inflammatory, Acute, and Chronic; Waxy and Cirrhotic. The commonest cause of the latter form being abuse of alcohol, particularly in the form of ardent spirits. Surgical Kidney is elaborately described under the following heads: 1. Chronic inflammation followed by absorption of the medullary portion and later on by stretching and thinning of the cortex without pyelitis. 2. Acute diffuse interstitial nephritis without suppuration. 3. Acute interstitial nephritis with scattered points of suppuration. 4. The cicatricial kidney.

The sections upon Diseases of the Liver are probably the least satisfactory in the book. There is, however, a masterly summary of the subject of Jaundice by Murchison. "Rheumatoid Arthritis immediately follows ordinary acute rheumatism in a considerable proportion of cases." In this view many will differ with Dr. Bruce.

Tubercle is perspicuously considered by S. J. Gee, and the same clear conciseness characterizes the articles upon Phthisis and Diseases of the Pleura. A contemporary reviewer has called attention to a typographical error of some importance, viz., the statement of the dose of picrotoxine as $\frac{1}{8}$ of a grain instead of $\frac{1}{60}$ for the night sweats of phthisis. The Diseases of the Brain and Spinal Cord are entrusted to the able hands of Hutchinson, Gowers, and Bastian. The account of the Diseases of the Spinal Cord is especially satisfactory. But enough has been said to indicate the scope of the book. The authors include many of the most noted

names in the British Islands, and the book is of value on this account as a reliable work of reference. Such general subjects as Hospitals, their construction and hygiene; Nursing, and the training of nurses; Disease and its treatment by rational methods based on the advance of the knowledge of the nature of disease and the scientific study of the action of medicines, are all discussed at length. Homœopathic treatment is described in the words of Molière, who wrote long before Hahnemann, as "l'art d'amuser le malade pendant que la nature guérit." But the antithesis is not stated, viz., that scientific therapeutics is but too often a meditation upon the causes of death. E. T. B.

ART. XXIV.—*Manual of Gynecology.* By D. BERRY HART, M.D., F.R.C.P.E., Lecturer on Midwifery and Diseases of Women, School of Medicine, Edinburgh, etc., and A. H. BARBOUR, M.A., B.Sc., M.B., Assistant to the Professor of Midwifery, University of Edinburgh, etc., with 9 lithographs and 400 wood-cuts. 8vo. pp. 644. Maclachlan & Stewart, Edinburgh, 1882.

THE term "manual," will convey to one who has not seen the volume under notice, a very imperfect idea of its character and value. We are obliged in general, to put a low estimate upon the class of books issued as manuals, which are usually very poor substitutes for standard works upon corresponding subjects. But in this instance we are happy to make an exception. What a digest of laws is to the legal investigator, this condensation of knowledge is to the gynecologist. We have here presented to us, in as few words as possible, a body of science, sufficient if extended to fill several volumes. The authors have collected from the best treatises and monographs, the latter chiefly from journals, in English, French, and German, the latest opinions and directions upon the diseases of women, their treatment and surgical management, and have presented in illustration, not only the diseased conditions to be treated, but an extensive armamentarium of instruments and appliances, to be employed in effecting a cure. Some idea of the research of the authors may be formed from the fact that the index contains the names of 286 writers, whose books and articles have been consulted and quoted. Among these we notice as frequently referred to, the names of Barnes, Bandl, Breisky, Matthews Duncan, Emmet, Foulis, Fritch, Gusserow, Hegar, Mundé, Nœggerath, Olshausen, Ruge, Schrœder, A. R., and Sir J. Y. Simpson, J. Marion Sims, Spiegelberg, Tait, T. G. Thomas, Virchow, Spencer Wells, and F. Winckel, which are very familiar to all gynecological students. Instead of the usual plan of giving the bibliography at the beginning or end of the volume, each chapter and special article commences with a list of the papers consulted in its preparation. This gives to the reader a very valuable index medicus, and adds very largely to the value of the work, by directing the student of any one portion, to elaborate treatises in which he may find the subject in question more fully presented.

We take great pleasure in recommending this work to the medical profession of our country, as fully up to the times, and one of great value for ready reference. The volume does credit to its publishers, its type being clear, and its wood-cuts well executed and effective. It will make quite an important addition to gynecological treatises. R. P. H.

ART. XXV.—*Minute Anatomy of the Central Nervous System of certain Reptiles and Batrachians of America. Illustrated by Permanent Photo-micrographs.* By JOHN J. MASON, M.D. Series A. Newport, 1882. Large 4to. pp. 24, pl. cxiii. Author's edition.

THIS handsome volume is in great part made up of a number of photographs adapted for surface printing, and illustrating the structure of the brain and spinal cord of the more common types of reptilian and batrachian life as they are met with in this country. A work so original in scope, so beautiful in execution, so gratifying to the feelings of national pride, is deserving of the warmest commendation. No similar work, so far as we know, has ever been undertaken for any fauna. The results are of great value, not only to the histologist but to the naturalist; for the structural features of the spinal cords of the animals taken for study are so pronounced that systematists cannot fail to make use of them, as they have already made use of characteristics of the brain. In glancing over the plates the observer can detect with ease the spinal cords of the chelonians by the relatively small amount of gray matter in the dorsal region, by the paucity or absence of cells in the anterior horns, by the great width of the anterior median fissure, and by the large amount of reticular fibres developed upon the lateral aspect of the gray columns. In the ophidians he finds that the posterior horns are almost united, the commissure is of enormous size, the sides of the cord possess two remarkable fibrous structures known as the lateral ligaments, the fissures are inconspicuous, and the posterior nerve-roots arise from the *cervix cornu* instead of the *caput cornu*. In the saurians he finds the commissure to be perforated longitudinally by a pair of columns of nerve-fibres. In the batrachians, the connective tissue is seen about the central canal to be of unusual development, while in the genus Siren it even embraces the cord as a cortical layer; connective tissue corpuscles are abundantly distributed throughout the cord, being better developed in the gray columns than in other groups; the posterior columns of the cervical portion are projected above the plane of the lateral columns, and exhibit distinct differences in the arrangement of nerve-fibres as compared with the remaining portion of the cord.

The author has not studied the spinal cord of the bird-type in connection with that of the reptilian. Many questions of relationship suggested by the plates must remain unanswered until examinations by methods similar to those here employed are made of forms that are already known to closely resemble the reptilian. It may be that series B of the work will contain the desired material.

It is well understood that the amount of gray matter in the spinal cord of the human subject bears an exact relation to the number and size of the nerves which arise from the cord, and that the cervical and the lumbar enlargements are correlative with the nerves supplying the limbs. Yet the author believes that no explanation has yet been given which accounts for all the variations as they exist in the cords of the lower animals.

In all the forms the posterior median fissure is less conspicuous than in man, while, as a rule, the commissural connections between the halves of the cord are more conspicuous. In describing these conditions the author speaks of the gray columns becoming fused. Would it not be a more appropriate use of terms to say that the division of the primal gray

column into a right and left part had in such examples been imperfectly accomplished?

The most important announcement in histology relates to the connections existing between the size of the nuclei of the so-called motor-cells and the power developed in the muscles. These cells are found to have average diameters, which are proportionate to the power of the muscles. If subsequent research should confirm the accuracy of this statement, it will go far in removing from histology the opprobium, so often urged by its detractors, that it has failed to contribute a single generalization or important truth to biology.

We have confined our remarks in this notice to the spinal cord, but the medulla oblongata, together with the cerebellum, the optic lobes, and the cerebral and olfactory lobes, have also been figured. We have no inclination to follow the author in this difficult field, since it is one that will not permit of brief survey. When the author shall have completed his entire series of publications, as we trust he will, we will have a mass of facts of immense value, not only to the histologist and the physiologist, but to the systematist as well. H. A.

ART. XXVI.—*Transactions of the American Otological Society. Fifteenth Annual Meeting.* 8vo. pp. 73. Boston: A. Williams & Co., 1882.

THE first paper is a report on *The Use of Soft Rubber Drainage Tubes in Chronic Suppurative Inflammation of the Tympanum, with narrowing or closure of the Meatus Externus*, by Dr. O. D. POMEROY, of New York.

The cases, which occurred among the children of a foundling asylum, were very obstinate, and could not be managed by any of the usual forms of treatment. Incision of the walls of the canal or an opening made into its deeper portion by an incision behind the auricle failed to be of use. At the suggestion of Dr. Chadbourne, physician of the asylum, rubber tubing was introduced into the meatus in these cases, and was found to answer admirably. A soft variety of tubing should be used, the black or red rather than the ordinary white, as the latter is too hard and stiff. It is sometimes necessary to commence with a very small tube, two or three lines in diameter, which is introduced by means of a stilet. Larger tubes are used as the meatus dilates. They are not perforated like the ordinary drainage tubes, as they are intended to protect the meatus from the ichorous discharge. Dr. P. claims that polypi of the canal are absorbed by the pressure of the tube, and that the canal is restored to its normal calibre by mechanical dilatation and relief from inflammation.

The tympanum is cleansed by syringing through the tube.

A Case of Abscess of Cerebellum following Otitis Media months after apparent cure, is reported by Dr. A. MATHEWSON, of Brooklyn.

The patient was a delicate child eleven years of age, and the disease began with an acute otitis media in June. In September there was suppurative discharge, the meatus was filled with polypi, there was an opening over the mastoid surrounded by exuberant granulations, and containing carious bone, and the facial nerve was paralyzed. By December 1,

the discharge had ceased, the openings in the membrana tympani and mastoid had closed, and the paralysis had passed away. About the first of March the patient was quite suddenly attacked by vomiting and headache, there was not much fever or mental disturbance, no paralysis, and no indication of present disease of the ear. There was no swelling of the optic disks. Death occurred in the middle of March, and an autopsy revealed "the veins and sinus filled with fluid blood, the meninges injected, adhesions at points over the petrous portion of the temporal bone, some small amount of pus under the dura over the tegmen tympani, and in the sheath of the 5th pair; and an abscess containing an ounce or so of fetid pus in the left lobe of the cerebellum. The ventricles were free from pus, though dilated with excess of serum. Examination of the ear and mastoid revealed no positive sign of present disease of bone or soft parts, except a possible softening of the tegmen tympani." Dr. J. Orne Green referred to a somewhat similar case that had occurred in his practice.

In contrast to this case, Dr. C. S. MERRILL, of Albany, reports one of *Acute Middle Ear Inflammation, with Death on the Fourth Day from Extension of the Disease to the Brain.* The patient, a bookkeeper, 32 years of age, was previously in excellent health, and stated that he had never before had any disease of the ear. On the 7th of November he noticed a sense of fulness in the right ear and dulness of hearing. This was relieved by leeching and inflation, but early on the morning of the 9th, he was attacked with severe pain, and soon became delirious. A free incision of the membrane, which was bulging and proved to be unusually firm, gave exit to a large amount of pus. Death, preceded by coma, occurred at 6 P. M. on the 11th.

Post-mortem examination showed all the evidences of acute meningitis, and pus was found over the region of the petrous bone. There had been perforation through the roof of the middle ear. "The fatal termination of the case was evidently due to the direct extension of the inflammation to the membranes of the brain through the roof of the middle ear, which in this patient was not a solid plate of bone, but cribriform in appearance." The author believes that no other case has been recorded in which death occurred so soon after the development of inflammation in the ear.

A case of *Aural Polypus, Facial Paralysis, Mastoiditis, and Chronic Meningitis, with Recovery from the two latter*, is reported by Dr. R. J. MCKAY, of Wilmington, Delaware. There had been discharge from the left ear for seven or eight years. A large polypus was removed, but granulations remained. There was swelling of the mastoid, and the indications of brain disease were persistent headache, nausea, slight delirium at night, and optic neuritis. The mastoiditis and the brain symptoms subsided under leeching and the use of small doses of calomel and hypodermic injections of morphia.

Dr. E. E. HOLT, of Portland, Maine, discusses *Boiler Maker's Deafness and Hearing in a Noise.* "The basis for the opinion here advanced upon deafness incident to the boiler-maker is founded upon the examination of forty men from the shops for making steam-boilers in Portland; while what is said upon the subject of 'hearing better in a noise' is based upon a careful examination of all that have come under observation who made the claim that a noise improved their hearing, amounting to over one hundred cases that have been examined." The deafer ear in the cases of boiler-maker's deafness was always on the side more exposed to the sound, usually the left, and generally if the left ear was the better one

the patient was found to be left-handed. As the tuning-fork was heard well when placed against the teeth or head, the author concludes that the conducting apparatus, and not the nerve, is at fault. The membrana tympani showed about the same changes as in "chronic catarrhal otitis media" (proliferation?), and the naso-pharynx was invariably in a catarrhal condition.

Dr. H. says that all the men engaged for any length of time in this occupation become more or less deaf, and believes that the exciting cause of the deafness is the constant agitation of the joints of the ossicles exciting inflammation and producing anchylosis, particularly of the stapes. He does not tell us what is the cause of the accompanying naso-pharyngeal catarrh. Dr. Brandeis, in the discussion of the paper, suggested that something might be due to the fact that men who work in boiler-shops are subjected not only to a great noise, but also to great draughts and changes of temperature.

The author thinks that the claim of hearing better in a noise is the result of errors of observation, as he has never met with a case that stood the test of careful examination. He agrees with Von Troltsch that "misapprehension and lack of proper observation are generally at the basis of these statements."

Dr. S. THEOBALD records a case of *Complete Closure of both External Auditory Canals, following Chronic Otorrhœa*, and one of partial closure. The obstruction in both cases was bony, and existed at the outer extremity of the osseous portion of the canal. Similar cases were referred to by several other members of the society.

Dr. H. KNAPP, of New York, in a paper *On the Treatment of Aural Polypi*, comments upon the fact that large polypi are more easily and radically removed than small ones, and recommends mechanical removal only in the former class. Small polypi with broad bases or granulations he attempts to shrink, usually by the frequent application of alcohol and boracic acid, or prepares them for extraction by letting them grow until they have become pedunculated. He prefers the forceps to the wire snare. In the discussion of the paper Wilde's snare, the galvanic cautery, and chromic acid had their advocates.

Dr. R. C. BRANDEIS, of New York, contributes a paper entitled *Exhaustion versus Inflation, or Rarefaction of Air in the Meatus in the Treatment of some of the Diseases of the Middle Ear and Membrana Tympani*. He calls attention to the disadvantages of catheterization and Valsalva's and Politzer's methods of inflation, and claims that in some cases of retraction of the membrane and anchylosis of the ossicles, more good can be accomplished by the use of Siegle's pneumatic speculum.

G. C. H.

ART. XXVII.—*Sarcoma and Carcinoma: their Pathology, Diagnosis, and Treatment.* By H. T. BUTLIN, F.R.C.S. 8vo. pp. 202. London: J. & A. Churchill, 1882.

THIS little volume is not an exhaustive or systematic treatise on sarcoma or carcinoma, or even a digest of our present information regarding them. It is simply a study of these neoplasms in their relations to cer-

tain organs or tissues of the body, and the author has selected the bones, testes, tongue, œsophagus, and tonsils for special consideration. Beginning with the testes, he has taken a number of cases from Continental, British, and American authorities, and has analyzed them with a view to finding whether they contain material of practical value for practitioners in general or surgeons in particular; and it is interesting to note that the author joins with the leading workers in pathology, in so far as he accepts the standard classification that took its origin from Virchow, and still maintains its reputation as our best working model.

If, in grappling with one of the most difficult topics in pathological histology, the author has succeeded in getting very little grain out of a large amount of chaff, the fault lies chiefly in the nature of the material. And it can have been no very easy task to have collected the forty-one cases that form the basis of the monograph (for such is the first and every subsequent chapter), and to have estimated the precise scientific value of each one. Indeed he can hardly have always succeeded in demonstrating to the critical reader the worth of his material, for in one instance at least, he assails an authority (Nepveu), impugning his evidence, and then in a subsequent place uses the same writer's cases as a basis for conclusions. He emphasizes, however, an important item, which has generally been known among pathologists, but which needs to be impressed upon the writers of surgical manuals. It is this, carcinoma is not in any one of its forms the most common of the malignant tumours of the testicle, but rather sarcoma, and in the ratio of two to one. Apart from this fact, which is mainly interesting in a pathological sense, the surgeon will have gained but little from the author's study of the organ, and he will be hardly better able than before to determine the character of the growth he purposes to treat. A single exception is worthy of mention, and this he finds when the growth has nodules that are cartilaginous to the feel. Should, in such case, the subject be a child, a diagnosis of sarcoma may be made with tolerable certainty. Evidently, then, this topic is one from which we have good reason to hope for much more precise information, nor will a perusal of this chapter be profitless, if it stimulates the surgeon or pathologist, or both, to greater care and thoroughness in the record of their observations, for there is no doubt that much of our present material is positively a bar to scientific inquiry, owing, on the one hand, to the imperfections in the clinical histories, or, on the other, to the errors in microscopic descriptions.

The second division of the author's subjects, which is made to occupy four chapters, concerns the neoplasms of bone and its coverings. Of 88 tumours having their origin between the periosteum and the bone, 28 arose from the femur. The following bones were attacked, the order of frequency corresponding to the order of enumeration: tibia, skull, humerus, pelvis, lower jaw, clavicle, scapula, rib, and radius.

The divisions of bone-sarcoma adopted are essentially the same as those in common use, but the term *osteoid* is rejected because unsatisfactory on the ground that *ossifying* or *calcifying* may always explain the proper condition. The term *osteo-sarcoma* is also objected to, on the ground that its significance differs according to the author who employs it. All primary malignant tumours of bone are sarcomas, is an axiom which is enunciated, but it is one that will certainly fail to receive universal acceptance.

With the consideration of *central sarcomas*, the author adds to his

three varieties of bone sarcomas, viz., the round-celled, the spindle-celled, the mixed, and a fourth, the myeloid or giant-celled.

The chapter on the tongue is interesting in this respect at least, that it illustrates the tendency certain organs have to be the seats of special forms of malignant growth. A record of 80 cases shows that carcinoma was the only kind of neoplasm, and epithelioma the only variety. So, too, the œsophagus was never attacked by sarcoma, for in the 59 cases enumerated there was but a single exception to the rule, and this a problematical one.

This little volume is certainly valuable in many ways, and merits careful reading. It is true that it adds little to our present stock of knowledge, but if deficiencies are shown, an important step has been taken towards remedying them.

Nothing appears clearer than that there is still great lack of material, or that the author has failed to find it. And good material is really wanting in many of the obscure fields of surgical pathology, such as have been brought under consideration. In them we cannot expect rapid or substantial progress until there is more intelligent co-operation among the many earnest and able workers that may now be found widely scattered in every part of the world. T. E. S.

ART. XXVIII.—*Cholera and Quarantines.*

"*Les Quarantaines dans la Mer Rouge et les Provenances de l'Inde. Extrait des Actes du Conseil Supérieur de Santé à Constantinople.*"

THIS interesting pamphlet contains the report of the debate on a communication opposing the quarantine restrictions on English vessels from India, addressed by the Governor-General of India to the Marquis of Hartington, Secretary of State for India, and presented to the Council by Dr. Dickson, sanitary delegate from England. This communication premises that all quarantine measures enforced in Egypt and at the Mediterranean ports, having in view the protection of Europe from an invasion of cholera from the East, are based upon two propositions enunciated by the Sanitary Conference of Constantinople, in 1866, and that of Vienna in 1874, to wit: that cholera originates in India and only in India, and that its manifestations in other places are due to direct or indirect importation from that country. Both of these propositions are questioned, and it is stated that the history of the disease, as shown by the annual reports of the health officers of the different provinces, offers an assemblage of facts of great value, which the conferences of Constantinople and of Vienna did not have the advantage of knowing. The paper then discusses the following questions: 1st. Do the Indian ports and the vessels sailing therefrom present a real danger for Egypt and the countries beyond? 2d. If so, can quarantine measures afford efficient protection against the danger? It is argued that if the relation between cholera and India be such as was believed by the two conferences the experience acquired during a long series of years on vessels from Bombay and other Indian ports, which have not been subjected to any quarantine restrictions, should have demonstrated the truth of the conclusions of these conferences, but this proof has not been found. Cholera existed in Egypt and in Europe in

1865. In 1866, it continued lightly in Egypt and thereafter ceased, while it effected considerable ravages in Europe until 1874. In fact, notwithstanding the pretended danger of vessels coming from India, Egypt has been exempt from cholera for fifteen years, although India during that period has suffered from deadly epidemics. The experience of the port of Aden is characterized as still more more remarkable. It is in daily communication with Bombay and other Indian ports which are distant but a few days' journey, yet it has not suffered from the disease during the thirteen years from 1868 to 1880, and its history, so far as it is known anterior to 1865, confirms the experience acquired since that time. It is represented that the fears of an importation of cholera from India were based upon the theoretical views of the conferences and not upon facts.

The second question is not satisfactorily discussed in the Governor-General's communication. A complaint is substituted that the days consumed during the voyage are not included in the term of the quarantine, and it is suggested that the period of detention is in contradiction with the conclusions of the International Sanitary Conference of Vienna, which said that the period of incubation does not exceed a few days.

The council appointed a commission of three of its members to examine and report upon this communication from the British government. Its report was criticized by Dr. Dickson, and a long debate, continuing during several meetings, was the result.

We translate from the minutes of the concluding session :—

"The Inspector-General expresses himself in the following terms: An interesting and prolonged discussion has just put into the clearest light the permanent danger of the importation of cholera by way of the Red Sea, and has demonstrated the necessity of taking efficient measures against the danger within the limits of the regulations actually in operation.

"Leaving on one side the historical view of the case, which has been discussed by the opposing parties with both talent and tenacity, let us take the one unquestioned fact which has been brought into relief in the course of the argument. That is, that the cholera, a disease endemic in the East Indies, takes on an epidemic and invading character at periods more or less separated; that the Mussulman pilgrimage to Mecca carries it to, and propagates it in, the Hedjaz either directly from where it originates or indirectly by intermediary stoppages in the navigation between India and the Arabian ports, if it be not opposed by careful preventive measures.

"Experience has undoubtedly proved that cholera propagates itself in the absence of quarantine measures, or when these are inefficient, as for example in Egypt in 1865, and at Mecca in 1882, during the last pilgrimage. On the other hand, the success of quarantine is complete when it is rigorously applied as it was in Mesopotamia in 1879, and at El Wedj and Thor in 1881.

"It is asserted again that what is necessary for pilgrims travelling in crowds in badly arranged and unhealthy ships, impregnated with infectious miasms, is not required for ordinary steam navigation where good sanitary conditions are the rule. It is undoubtedly true that there has been no example hitherto of a ship without pilgrims on board being the means of bringing cholera into Egypt.

"The logical conclusions to be deduced from these teachings of experience are to be found in the following propositions which he (the Inspector-General) submits to the judgment of the council.

"1st. The Mecca pilgrimage ought to be carefully watched.

"2d. A permanent and thoroughly equipped lazaretto ought to be established on the shores of the Red Sea, to be used as a station for the examination of pilgrims before they are allowed to enter the Hedjaz.

"3d. Ships engaged in the pilgrim trade must submit to all regulations and to all the unexpected demands which may be necessary for their proper supervision.

"4th. On the other hand, ordinary navigation between India and the Red

Sea, in good sanitary condition, having no pilgrims on board, and not having had any signs of cholera during the voyage, has the right to come under the 'general regulation' issued in 1867.

"5th. Ships of the above class hailing from a port where cholera is epidemic will have the number of days occupied by the voyage counted in as part of their quarantine time, which will be completed by twenty-four hours of observation at the port of arrival.

"6th. If cholera does not exist in epidemic form at the starting or calling ports, free entry into the port of arrival is allowed to them.

"7th. What establishes the good or bad condition of a starting port, to give the right of free entry, or *vice versa*, is the presentation of a sanitary certificate, stating the presence or absence of cholera, or its complete disappearance, at the end of an epidemic.

"8th. The sanitary certificate is granted by the competent local authority. It is absolutely necessary that it should be *visé* by Turkish consuls when the destination of the vessel is in the Ottoman Empire. If the certificate is irregular, the ordinary quarantine is applied, or a fine imposed, as the case may require.

"In the above propositions he (the Inspector-General) has looked at the Indian traffic and the Red Sea quarantine purely from a practical point of view, without regard to the dispute as to how cholera was introduced into the Hedjaz in 1881, whether directly from India or indirectly in some other manner.

"What is absolutely certain and undisputed is the fact, that when cholera exists in the countries which send out pilgrims, these latter bring it into the Hedjaz. To prevent its introduction in such manner by wise regulations strictly enforced, without at the same time touching the general interests of commerce, is the duty and the aim which the International Council of Health and the administration have at heart.

"The Inspector-General (Bartoletti Effendi) invites the members of the council to give their opinions on what he has just proposed.

"The council adopts unanimously the propositions of the Inspector-General in reply to the communication of the English government, which was presented by Dr. Dickson, and declares the discussion at an end.

"Session of the Council of Health, 5th December, 1882." C. S.

Art. XXIX.—*A Record of eleven years of the Mission Hospital of Foochow, China, and four years of the Foochow Opium Asylum.*

Through the kindness of Dr. H. T. Whitney, now in charge both of the general hospital, and opium asylum of Foochow, the reviewer has been put in possession of a full series of reports of both institutions, which contain many points of interest to the physician, surgeon, and philanthropist. These are here presented in a condensed form to the reader, showing the prevalent diseases of the Chinese; the character and results of the surgical operations performed upon them; some of the peculiar medicines of the natives and their medicinal formulæ; and the effects of the opium habit and opium cultivation upon them.

Foochow is a large seaport, and contains, as nearly as can be ascertained, over 600,000 inhabitants. Its *chief export* is tea, and its import, opium. It consists of a fortified portion, inclosed by a wall, twelve feet thick and thirty feet high, pierced with seven gateways; an extramural suburb; and a fluvial portion, the inhabitants living in boats. The hygienic conditions of the city are bad; the people uncleanly; there are no public bath houses; and paludal diseases, especially intermittent fever, are prevalent.

"Western medicine" was introduced into Foochow, in 1870, by the late Dr. Dauphin W. Osgood, under the auspices of the A. B. C. F. M., who commenced by opening a dispensary on the main street leading to the island of Nantai, an important suburb, which was soon followed by another on a second busy street. From this out-door service there very soon grew a necessity for a hospital, and patients were received into a building rented for the purpose. This in time developed into a general hospital, for which purpose a frame building was erected in 1877–78, at a cost of $1800, capable of accommodating from 50 to 60 patients. It consists of a main building containing eleven rooms, a separate culinary department with three rooms, and a gate-house. The rooms in the main building are seven for free patients, one for pay patients, two for hospital assistants, and one for operations. Two dispensaries are still kept in operation, one at Hapwoka and the other at Watergate, and patients prescribed for on Mondays, Tuesdays, Thursdays, and Fridays. These are under the care of the physician in charge of the general hospital, and are very largely patronized.

The demand for treatment of opium cases desiring to reform, and the necessity for a temporary seclusion to effect a good result, caused the opening of a special Opium Asylum in 1878. This is independent of the hospital in one sense, as it is self-sustaining, but is under the same medical supervision. It has had as high as 540 inmates in one year (1878–79). Besides these medical establishments in Foochow, there is also a female hospital under the care of the Misses Drs. Trask and Sparr.

Service of Dr. Osgood.—As stated, his medical work in Foochow commenced in 1870. His first annual report is dated June 1st, 1872, and the fiscal year of the present hospital commences with that date. Dr. Osgood first admitted opium cases into the rented hospital in 1876, and the last Opium Asylum report (its fourth) is really the sixth. He had opium smokers as patients from the first year of his labours, in 1870; his first report showing a record of seventeen. In all, he had 1758 cases of the opium habit and 103 cases of suicidal opium poisoning. This subject will be more fully examined hereafter. Dr. Osgood had just completed his ninth annual report, in which he gave a tabular record of all his work, and had read the last proof of an anatomical treatise in the Chinese language, when he was taken sick, and died on August 17th, 1880. He was a large, vigorous man; earnestly devoted to his work, and is said to have been remarkably dexterous in the use of the knife. He was a good Chinese scholar, and his loss to the cause of medical education in China was severely felt. In character he was a very decided Christian, and his belief largely influenced his medical activity. He had under care 51,838 cases in Foochow, and performed over two thousand surgical operations, of which 47 were amputations; 26 removals of the scrotum, the heaviest weighing 50 pounds; 181 removals of tumours; 3 extirpations of portions of the lower jaw; 10 removals of the eyeball; 42 were for cataract; 50 for hare-lip; and 9 were resections of joints, or long bones. As an evidence of the prevalence of two maladies among the Chinese, I will mention that he operated upon 370 cases of fistula in ano, and 240 of hydrocele, in ten years; he also operated 486 times for entropium. This last disease would appear by this to be much less prevalent than in Canton, where the cases average one a day in some years. Stone in the bladder, so very prevalent in Canton, is very rare in Foochow, only eight cases having been reported in ten years' service.

General Hospital Dispensary and Service, 1871–1882.—Dr. Osgood was succeeded by Dr. H. T. Whitney, a graduate of the University of New York, who was first stationed at Shaw-wu, in 1876, where he treated over 5000 cases, and had been a few months in charge of the dispensaries of Foochow, when Dr. Osgood died; the reports of 1880–81 and 1881–82 were prepared by him, including the third and fourth reports of the Opium Asylum. As might be anticipated from their habits, the diseases of the skin are the most abundant of all the maladies among the Chinese in Foochow, who throng the dispensaries on prescribing days. The total of all the cases reported amounts to 14,385, of which scabies and eczema constitute a large proportion, particularly the former, which amounted in one year to 986. In the two years' service of Dr. Whitney, a special record has been kept, showing 860 cases of itch and 227 of eczema in 3393 patients having skin diseases.

Prevalent Diseases.—Acute and chronic rheumatism, chiefly the latter, is the most prevalent of all the general maladies, 3763 cases having been under treatment by Drs. Osgood and Whitney. The Chinese are very much exposed to the weather in their avocations, and often work in water in their agricultural pursuits; their clothing is very inadequate; their food imperfectly assimilated; and they have but little knowledge to fit them to guard against disease. Next to rheumatism stands *dyspepsia*, with 3133 cases under treatment. This disease is to some degree, almost universal among the poor of China, whose food costs on an average from $1.50 to $2 per month, and consists of rice or dried potato and turnip-tops or other greens, fried in oil, with a little dried fish or bean-curd. This diet is eaten hurriedly and is often bolted down without mastication. With the dyspepsia is often associated constipation or diarrhœa, and the presence of numerous long, round worms (*ascaris lumbricoides*), and fistula in ano, as already shown, is very prevalent. Next in order, according to the reports, is *bronchitis*, which is often associated with asthma, and prevails in a chronic form to a large extent among opium-smokers; the number of cases treated was 2166. *Intermittent fever* in its different types is next in order of frequency, with 1317 cases. The Chinese have learned the value of sulphate of quinia and use it with several other medicines now sold by them, such as *tinct. ferri sesquichlor.*, Fowler's solution of arsenic, santonine, and iodine. *Phthisis* is much less abundant than might be supposed, considering the delicacy of appearance of the Chinese and the prevalence of bronchitis and fistula in ano; the cases recorded amount to 272 in twelve years, or less than half of one per cent. of the medical cases. Cases of hæmoptysis of a non-tubercular character are not uncommon, and are ascribed by Dr. Whitney to the presence of a parasite. *Elephantiasis* appears by the record to be almost as often met with as phthisis, the number treated reaching 230. *Hernia* is a very common affection, 787 cases having been observed, as follows: double, 77; right inguinal, 534; left, 176. The prevalence of the ascaris lumbricoides is shown by a record of 858 cases. Syphilis and gonorrhœa are, of course, very prevalent; the cases of the former numbering 1356; the latter less than five hundred.

Rare Diseases.—Hydrocephalus was met with but once out of 40,000 cases of disease; the patient was a boy of seven years, with a head double the normal size. Tetanus was observed in three cases. Insanity is said to be comparatively rare (?), but it is impossible as yet to ascertain the exact truth. Suicides are frequent; intemperance very exceptional; there is no intermarriage; and the people seldom fret or hurry; the insane are

secluded privately, and it is said are not infrequently put to death by their relatives. Dr. Whitney, having had an experience as an alienist, will probably in time discover the truth of this question. He reports 32 cases for his two years' service; Dr. Osgood but 21 in ten years.

Surgical Cases.—The most common of all injuries resulted from beating, of which 1990 were under treatment: then incised wounds, 306; and, third, bites of animals, chiefly dogs, and human beings, 95. Human bites are often very severe, and are followed by much suppuration and destruction of tissue; the lacerated parts appear to be affected poisonously. Dislocations were treated in 51 cases; fractures in 42; punctured wounds in 65, and gunshot in 35.

Surgical Operations.—The native Chinese physician, unless in a very exceptional case, never uses a knife, not even to open an abscess; never pulls a tooth; sets a fracture with any accuracy, or reduces a dislocation. The patients are then by training, custom, and natural timidity, averse to operative surgery; and are specially opposed to the loss of a limb for the relief of suffering or saving of life. They have besides an idea that if the body is mutilated in this world it will be imperfect to the same degree in the next. Friends often interfere against operating, and the patient must be left to his fate. The amputations for twelve years have been as follows: of the thigh 2; at the knee 1; of the leg 1; foot 3; toes 12; at the shoulder 1; of the arm 6; at the elbow 1; and of the fingers 26 = 52. The deaths were as follows: amputation of toe 1, resulting in an attack of phlegmonous erysipelas; amputation of arm 1, in a month, cause cancer; amputation of thigh 1, death from exhaustion; limb gangrenous at time of operation, which had been previously amputated at a lower point.

As an evidence of the disparity of numbers between those making application and submitting to operations, we have only to mention a few of the more numerous surgical maladies, viz., patients with entropium 609, operated upon 304; with pterygium 255, operated on 83; with fistula in ano 772, operated on 463; and with hydrocele 87 operated upon out of 292. Cataract cases show the same difficulty, as only 53 out of 305 were operated upon. Not half of the tumour cases, even where the growth is fatty and easily removable, will submit themselves to the knife. Elephantiasis of the scrotum has been removed 33 times without a death; and the same has been the result of the operation in China in more than double this number of cases. The Foochow record shows that 92 patients applied for treatment in twelve years.

Deaths.—Of 2463 patients in the general hospital in twelve years, 14 have died, one each, of the following diseases: Chronic bronchitis, an old man; aneurism; erysipelas after removal of toe; ascites, admitted in extremis; ovarian dropsy, on third day after second tapping; tertiary syphilis; hemorrhage after lithotomy; cancer; resection of head of femur in a child; tetanus; dysentery, patient admitted in a dying state; kidney disease, admitted in extremis; exhaustion, after a second amputation; and anæmia and exhaustion eight days after the removal of a malignant tumour of the parotid gland.

The Opium Asylum.—As already stated, opium cases have been under treatment for reformation in Foochow since 1870. The last published record shows that up to June 1, 1882, 2139 had been received. Besides these, 123 cases of opium poisoning were visited at their own homes. The opium habit of the Chinese has been written upon by many travellers; business men temporarily residing in China, missionaries and physicians,

generally in condemnation of it, but in some instances quite the contrary, the practice among the upper classes being regarded very much as the moderate use of wine in social life is generally thought of here. This question has been taken up in quite a number of the annual reports of Dr. Kerr, of Canton, and Drs. Osgood and Whitney, of Foochow, all in condemnation of the practice of opium smoking, in whatever class it may be indulged in. As it is well to let these gentlemen speak for themselves, we will present abstracts from their own writings.

Dr. Kerr, Report of 1868:—

"The increasing prevalence of this habit, the enormous expense it entails upon the people, the dreadful suffering it inflicts upon its victims, the poverty and want which follow its indulgence, and the moral corruption which it causes, should excite the sympathy of all men. I am persuaded that no man could witness what I see, week after week, and month after month, in the prescribing room, without being convinced that it was a terrible evil, against which all friends of humanity should wage a war of extermination."

"The opium-smokers' ward of the hospital furnishes facts which cannot be disputed. For any one who wishes to study the subject, no better place can be found. The statistics," kept of each patient on the hospital books, "show, that the monthly expenditure varies in different cases from $1.50 to $15.00, and it must be noted that this expenditure is constant, or steadily increasing, and only diminishes under the pressure of poverty." (Report of 1875.)

That Dr. Kerr's opinions are not based entirely upon an experience with the poor, we have only to refer to his record of 1864, in which he reports the cases of two young men, one "a literary graduate of the first degree," the son of a wealthy widow lady; and the other, the son of a mandarin, admitted at the age of 24, after indulging in the habit for five years.

Dr. Osgood:—

"The evils resulting from the continued use of opium, have never in my opinion been overrated. The stranger in passing through the treaty ports, and the merchant who has no intercourse with the mass of the people are not in a position to give a fair opinion upon the question." "The well-to-do Chinaman who has good food and warm clothing, suffers less from smoking than the workingman who not unfrequently foregoes his food and clothing to secure his accustomed allowance of opium. Rich and poor alike find that the continued use of opium interferes with digestion, diminishing the secretions of the alimentary canal, producing constipation, loss of appetite and the usual discomfortures of dyspepsia. In nearly every case there is difficulty in breathing, and in many, chronic bronchitis, and asthma. The smoker becomes anemic and impotent." (Report of 1877).

"I am free to admit that there are cases where opium is used constantly for twenty or even thirty years in small quantities, with comparatively little injury to the user, but these cases are the exception and not the rule. It is also true that a given amount of opium smoked is less injurious than when swallowed. *I have never yet heard a heathen Chinaman defend the use or sale of opium, but on the contrary they universally condemn them.* The only apologists for the use of opium have been representatives of Christian lands, many of whom have had but little practical knowledge of the evil resulting from the opium." (Report of 1879.)

Dr. Whitney:—

"The secondary effects are, inertia of mind and body, corrupt morals, impotence, disease, destruction of home and family, and finally beggary and death." "Many of the petty officials, soldiers, yamen runners, and officers' attendants and servants use opium, but the higher and better class of officers condemn it in the strongest terms." His excellency Li Hung Chang, Prime Minister of the Chinese Empire, thus expressed his views in 1878: "The evils arising from opium smok-

ing are very great. All benevolent persons are greatly distressed thereby. The Emperor has frequently sent down his commands to prohibit the growth and use of opium in China. The difficulty of enforcing these prohibitions arises from the fact that the importation and sale of the foreign grown is legalized in the treaty on the payment of the duty." (Report of the Opium Asylum for 1880–81.)

"If we consider the rapid increase of opium culture in China and the consequent turning of large plains, formerly devoted to raising cereals for food, into poppy fields, and that this grain-raising labour is also turned to the production of opium, and that, as the statistics show, this class of labourers is largely given to the use of this drug, we have a still stronger indication of evil-foreboding to this country unless something is done to stay its progress and avert its certain results." (Opus cit., page 21.)

Prevalence of the Habit.—This is very difficult to ascertain. It has been computed, that about four per cent. of the Chinese smoke opium, but this is simply conjectural; in certain ports of entry, and among certain classes, the habit is wide-spread. Foochow is said to have more opium dens than rice shops. Dr. Osgood computed the opium smokers among men, at 45 per cent., 30 per cent. being *confirmed*, and 15 per cent. *occasional*. Of chair coolies, boatmen, and the attachés of official establishments, it is said that from 50 to 75 per cent. smoke opium. Very few women ever smoke it.

Amount of Opium used; its strength and cost.—The Chinese weights are the *Candareen*, equal to $5\frac{5}{8}$ Troy grains; the *Mace*, $58\frac{3}{10}$ grains or nearly a drachm; and the *Tael*, 583 grains, or 10 mace. The Chinaman smokes a prepared extract, which is said to be nearly three times the strength of the crude drug. According to the record kept in the Foochow Opium Asylum up to June 1, 1882, the amount used ran from one candareen a day, to a tael, and the average of 1789 men's daily allowance was 3 mace. Dr. Osgood computed the average at about 2 mace: Dr. Whitney rates it much higher. We go by the record, which makes 1789 men consume 5056 mace *per diem*, or a slight fraction below three mace each. A mace costs usually 100 cash, or $8\frac{3}{4}$ cents, and the average labourer gets from 20 to 25 cents *per diem*. The inmates of the asylum have been largely composed of storekeepers (515), farmers (460), artisans (194), and soldiers (189), or 1358 out of 2133. A labourer usually smokes up at least half of his wages, his average being one and a half mace, costing thirteen cents.

Origin of the Habit.—It was claimed a few years ago, by one who professed to have carefully investigated the subject, that at least sixty per cent. of the Chinese commenced to smoke opium for the purpose of increasing their sexual desire and capacity; but this is not at all the opinion of Dr. Osgood or Whitney. The latter questioned 287 patients, and gives the origin of their habit, as "temptation and pleasure" 181, and "disease," 106. He says, in his report of 1881–82:—

"By temptation and pleasure are meant those who acquired the habit through the pleasant sensation of an opium-intoxicated state, which I find upon a somewhat extensive inquiry to have been begun in the majority of cases through the urgent invitation of a friend who had already acquired the habit, and that afterward the remembrance of the pleasurable sensations incited to a repetition of it until it finally became a habit." "So I think in reality temptation is the beginning of nearly all opium smoking aside from disease. But as very few care to confess that they were drawn into the habit by others, they more invariably give the reason as *pleasure*, when in fact it was *temptation*. Under *disease*, a large variety of complaints are given, such as cough, dyspepsia, diarrhœa, dysentery, hemorrhoids, stomach ache, seminal emissions, backache, gonorrhœa, hydrocele, asthma, rheumatism, etc."

In the great majority of cases, the habit is contracted between 15 and 35 years of age. The classes and ages of these habituées "represent the strength and thrift of the country" as a general rule, and hence the prevalence of the habit gives a dark background to the future of the Empire. The cultivation of the poppy plant has extended into Manchuria, and over fourteen of the eighteen provinces of China proper.

Treatment of Cases in the Asylum.—In his last annual report (1879–80), Dr. Osgood thus writes: "The plan of treatment followed in the Opium Asylum consists: 1. In confining the patient in the building for the first week. 2. In the total abandonment of the opium from the commencement of treatment. 3. In attention to the diet, giving food in small quantities frequently." Dr. Whitney says of this: "The diet for the first five days should be simple but nutritious, milk, congee (rice-water and chicken soup) and eggs, beef, chicken and mutton teas," "rock candy and a few kinds of fruit work well." 4. "Chloral hydrate 20 grains every hour as required, for the first two or three days. This is only given to the extent of relieving the suffering of the patient. Bromide of potassium, quinine, iron, tonics, astringents, all have their appropriate places."

The suffering lasts usually from one to five days, and the habit is broken in from four to seven days. After ten days they are generally anxious to be discharged, and this is granted except in extreme cases. Each man on his admission deposits two dollars security, one of which is returned him if he remains until discharged. From 60 to 80 per cent. are believed to be reformed. The smoking habit is much more rapidly eradicated than the chewing one, which is quite rare with the Chinese. There were 15 chewers among 984 patients, admitted up to June 1, 1879, who took from 5 candareens (29 grains) to 3 mace (175 grains) of prepared opium, a day. A Buddhist priest who smoked an ounce of opium daily, was discharged in ten days; his craving for the drug having disappeared in that time.

Chinese Medical Practice is referred to by Dr. Osgood in several of his reports, which show it to be upon a par with that of Europe five hundred years ago. Although they use rhubarb, gamboge, gentian, catechu, and other legitimate remedies, the Chinese nostrums are often of the most disgusting character, and their whole system of medication is empirical in an extreme degree. Dr. Parker gives a specimen of their best surgical attempts upon a patient from whom he removed a large glandular tumour of the face in 1851, which had been growing for seven years, attaining a size of 2½ feet in circumference. Dr. No. 1 punctured the mass with an iron probe, causing it to bleed profusely, after which he inserted a wire seton to excite suppuration and thus "dissolve the growth." This produced such agonizing pain that it could only be borne a few days. Dr. No. 2 applied medicinal cakes to rot it away, causing a deep sloughing and a profuse purulent discharge. Dr. No. 3 made great pretensions to skill in curing tumours. He thrust in a small knife to the depth of several inches, intending to cut away the tumour and then apply a plaster; but he produced such a hemorrhage that the man nearly lost his life. The native method, according to Dr. Osgood, of curing a dog-bite is to draw a circle around the wound and write the word for Tiger in it, the tiger being more than a match for the dog. Consumption is treated by various remedies, one of which is prepared by boiling a placenta in an earthen urinal which has seen long service, for two hours, when it is to be made into pills or eaten in substance. Believing in the *similia similibus curantur* theory, and mistak-

ing the purring of a cat for asthma, they administer the excrement of the animal for this disease. Believing also that syphilis and various ulcers are due to some malignant poison in the body, they prepare a nostrum known as "the five poisons," which they administer in pills. It is composed of dried snakes pulverized one ounce: wasps and their nests, half an ounce: centipedes three ounces: scorpions six ounces: and toads, ten ounces, ground up and mixed with honey, and then formed into pills. In a Chinese Materia Medica, in which are cuts of over three hundred medicinal plants, Dr. Osgood found "*bat excrement*," as a remedy for cataract, ague, eczema, opacity of the cornea, and abdominal pains. "*Dog flesh*" that of a yellow animal for dyspepsia, and of a black one for kidney diseases. "*Urine of the white horse*," for worms, obstinate vomiting, and loss of appetite, etc. etc.: with others still more disgusting. In his report for 1875–76, Dr. Osgood reproduces several rude cuts giving the conjectural human anatomy of the Chinese, which are very curious, and wide of the truth. The cholera year (1877) produced some singular plans of treatment, one of which was to rub an earthen spoon with tea oil; then rub the patient's spine with it until small black spots appeared, which were to be punctured with a needle down to the bone; after which a dose of salt, ginger juice, and boy's urine, in hot water, was to be administered.

Dr. Osgood says in conclusion: "We only make mention of a part of this class of medicines. If any are disgusted by the mere account, let them think how much worse it would be were they obliged to take them internally. We would be glad to have those good people in New York and San Francisco who have patronized the itinerant Chinese quacks, read these notes, and trust they may get good from the reading." Think of privy maggots, washed, dried, fried, pulverized, and made into pills, as a cure for worms, syphilis, vomiting and skin diseases; and of the scrapings of old commodes as a remedy in the after-treatment of parturition. It is not to be wondered at, that efforts are being made to educate the Chinese in medicine, and that every foreign managed hospital is the nucleus of a future medical school. The demands for a legitimate medical treatment on the part of the Chinese is shown by the following evidence. Mr. Jeremiassen a Dane, formerly in the customs service at Formosa, studied medicine under Dr. Kerr at the Canton Hospital with great diligence for seven months, during which time he must have seen some thousands of out and in patients. He then took a tour of two and a half months through the coast towns of the large island of Hai-nan, making its entire circuit. At every town, patients flocked to see him for advice, the maximum number in one day being four hundred. He performed numerous minor operations, that for *entropium* being the most abundant. It is his intention to continue his studies at Canton, and then establish a medical mission at his own expense in Hai-nan. The cost of building and maintaining a hospital in China, is fabulously low. In the Swatow Hospital, where the free patients provide their own food, there were last year 2872 patients: and the whole expenses of the institution amounted to $2318.48. There were 665 operations performed upon the eye; and 385 on the body generally, 53 being for the removal of tumours. R. P. H.

ART. XXX.—*Fistula, Hæmorrhoids, Painful Ulcer, Stricture, Prolapsus, and other Diseases of the Rectum: their Diagnosis and Treatment.* By WILLIAM ALLINGHAM, M.D., F.R.C.S., etc. Fourth revised and enlarged edition, with illustrations. Large 8vo. pp. viii., 168. Philadelphia: P. Blakiston, Son & Co., 1882.

IN turning over the pages of this volume the first point we notice is the enormous preponderance of cases of fistula over all others treated in the author's special hospital: 1208 out of 4000, while of hæmorrhoids there were but 965 cases. The reliability of this apparent contradiction of the usually accepted belief that hæmorrhoids constitute the most common disorder of the rectal region has been called in question, but the author maintains that it is correct, and the records of a large hospital with which we are familar show the ratio of fistulæ to hæmorrhoids to be high enough to make us very ready to accept what at first gave us the impression of being contrary to our own observation.

With this we pass on to the chapter on examination of patients, which is most excellent, recommending an orderly and thorough method, and giving a timely caution against being too ready to try Simon's method of exploration of the rectum. Incidentally the author states that he has sewed up three recto-vesical fistulæ "made by experienced surgeons in performing lithotomy." If so many accidents of this sort came to be reported by one specialist, how many may there be in all?

Under the head of "fistula in ano" a number of cases of spontaneous cure are cited, and a number where the application of carbolic acid effected a cure—but most of these were not fistulæ but *sinuses*, incorrectly termed "blind fistulæ." The elastic ligature is recommended to be used when patients are timid, and when it is certain that there is but one sinus. The author's preference, however, is for slitting a fistula open into the bowel, and he describes the best method of doing this and its attendant details with clearness and precision. Noteworthy is his recommendation of M. Salmon's "back cut"—dividing the wall of a sinus, opposite to where it has been split. We find that he recommends packing the sinus after it is slit. Mr. Henry Smith, of London, distinctly warns against *packing*, but will have lint or cotton *laid* snugly, but without exerting pressure, in the track of the sinus. If the object be to check hemorrhage we agree with the author, but if there be no considerable bleeding, with Mr. Smith.

As to operating when phthisis coexists, Mr. Allingham does not show the usual fear of untoward consequences; and he explains that some phthisical persons do badly when subjected to any operation, but in the majority of cases they will do as well after operation for fistula as could be expected of any broken-down patients, though the mere act of coughing is prejudicial to the healing of a fistula.

When speaking of hæmorrhoids, the author sensibly calls attention to the fact that "the anus requires quite as much washing as any other part of the body." He might have said more without stretching the truth.

For internal hæmorrhoids excision is said to be "one of our best operations," though not applicable to very large or very numerous piles. Carbolic acid injections are dismissed with a tone of prejudice which corresponds with the author's evident ignorance of how they should be used and what may fairly be expected of them. Dr. Kelsey, of New York, in his newly published book on this subject, says of this method, that he has

used it many times, and, except in one case, has never had cause to regret using it. Mr. Henry Smith's clamp and cautery method the author also dismisses with his disapprobation. It is, he says, six times as fatal as his own method. Crushing he thinks better of. The method known by his own name—which was, however, devised by M. Salmon, to whom he duly credits it—is described in full, and of course recommended as the best. And so most surgeons consider it.

The chapter on "*procidentia recti*" stands for what on the title-page is called "prolapsus." Why these titles should not correspond we do not see, nor why both should not be put into English. The substance of the chapter might be improved by making clearer distinction as to the different varieties of prolapse.

Polypus and pruritus are next taken up, and then follows a chapter on fissure and painful ulcer. This is one of the best chapters in the book, distinguished for its practical character and good sense. The chapter on ulceration and stricture of the rectum is largely controversial, and much space is devoted to defending the view—now pretty generally adopted—that strictures are usually dependent upon malignant new formation or syphilis. Either colotomy or linear rectotomy is the operation recommended for this condition.

For cancer the author has excised the rectum in its whole circumference only six times since the middle of 1879. This is because of the bad results occurring in his experience and observation. Of sixteen patients thus treated by him only one is living, and he in a miserable plight. The choice between excision and colotomy depends upon circumstances which are by no means clearly stated by the author, and he evidently considers the prospect after either to be gloomy enough to prevent any surgeon from undertaking it with alacrity.

Rodent ulcer, villous tumor, neuralgia, and inflammation next receive brief attention, and the book is finished, with the exception of a very poor index, where for example, we find "Acorns, powdered, for diarrhœa of procidentia," and no reference whatever to "diarrhœa" by itself or under the heading of "procidentia." It is a pity that our transatlantic brethren have not yet learned the art of indexing; for a good index would be a valuable exchange for half of almost any book that ever was written.

Beyond what has been said we have little to remark about Mr. Allingham's book. It has received such practical recognition that he might be tolerably indifferent to a reviewer's praise or blame. Yet we cannot forbear adding that we think it would contribute to his reader's pleasure and not diminish his own profit if he would, in his next edition, leave out the occasional evidences of prejudice and ill-will which can be found in this one. For it is a pity that any such blemishes should be found in a book so admirable in many respects, so invaluable to any one who has to deal with disorders of the rectum and anus either as a writer or as a surgeon.

C. W. D.

ART. XXXI.—*On Slight Ailments, their Nature and Treatment.* By LIONEL S. BEALE, M.B., F.R.S., Prof. of Medicine in King's College, London. Second edition, enlarged and illustrated. 8vo. pp. 283. Philadelphia: P. Blakiston, Son & Co., 1882.

"MANY of us, while in perfect health, might leave our pocket handkerchiefs behind without experiencing inconvenience, but when suffering from a cold it is well not to be neglectful. A quantity of secretion is poured out from the mucous membrane of the nose, and in many cases also from that of the windpipe and bronchial tubes." (p. 213.)

Most sage counsel, worthy of a father of medicine. Why? Because all parents desire habits of neatness in their children. The children of to-day, *i. e.*, students and young practitioners, are the men of to-morrow, and we feel that their leisure moments would be profitably employed in the perusal of this work. That its teachings are orthodox, no one who reads the above extract can doubt. Attention to detail characterizes each page, and all the sections. But if its counsels are homely and perhaps trite, they are, at least, quite correct, and the practice is based on approved standards. The new edition does not materially differ from the old. The table of contents comprises sections as follows: Peculiarities of the tongue in slight ailments; offensive breath; nausea; indigestion, its nature and treatment; constipation, and its treatment; diarrhœa; vertigo; biliousness and sick headache; neuralgia and rheumatism; the feverish and inflammatory state; the actual changes in fever and inflammation, and common forms of slight inflammation, including sore throat, conjunctivitis, etc.

E. T. B.

ART. XXXII.—*Health Reports.*

1. *Fourth Annual Report of the State Board of Health of Illinois.* 8vo. pp. 245. Springfield, 1882.
2. *Seventh Report of the State Board of Health of California.* 8vo. pp. 128. Sacramento, 1882.

1. THE volume from Dr. John H. Ranch, the indefatigable secretary of the *Illinois* board, although it contains some 200 pages of fine print, is in reality a health *report*, being altogether made up of records of the work of the board, without any of the supplementary papers upon diverse subjects, which appear to be generally deemed necessary to give the annual publications of State boards of health a sufficiently imposing and bulky aspect.

Accounts of the meetings of the board, of questions propounded to candidates for its licensing certificate, of the organization and enforcement of an immigrant inspection service as a guard against variolous infection, and the successful stamping out of smallpox in over one hundred and fifty localities in the State, together with those of the prominent part taken in the Sanitary Council of the Mississippi Valley by the Illinois representatives, are all interesting and important, but the great work of the year, as many of our readers are aware, has been that immense service to the whole medical profession, the compilation of a full report on the medical educational institutions of this continent, in order to determine which are and which are not in "good standing" at the present time.

According to this voluminous and invaluable document, constituting a directory of American medical colleges, the details of which have been obtained "from the published announcements last received, and from other available sources," there have been 175 institutions granting medical diplomas or licenses in the United States and Canada, since the year 1765 up to the present date, and of these 119 are still in existence. Diplomas from 123 of the total number of these schools have been presented before the Illinois State Board of Health, of which number 99 have been recognized as "legally chartered medical institutions in good standing," 5 are accepted conditionally, and 18, the titles of which are given in full, are rejected.

This exhaustive directory of the reliable and unreliable medical schools in our country is obviously the product of a vast amount of pains-taking investigation, and as such is worthy of high praise. Its highest value, however, to all lovers of true medical science lies, of course, in the grand movement in favour of elevating the standard of medical education which it renders possible—a movement which, now that it is happily inaugurated by the Illinois Board of Health, promises, if ably seconded by other State authorities, to wipe out the burning disgrace of our profession here in America, accomplishing that purification and ennoblement of medical teaching here, in which the Association of Medical Colleges has, year after year, so signally failed.

2. From the *California* Report we learn that during the year 1881 the State was subjected to the very low mortality of only 13.65 (?) per 1000, notwithstanding its people were compelled to struggle with emanations from the great smallpox epidemic, which has proved so fatal on the Atlantic coast. So far this contest has been waged so successfully that in the year only 75 deaths are attributed to variola. The most fatal disease of the zymotic class was typhoid fever, although diphtheria was the cause of death in 87 instances. Reasonable complaint is made by the permanent secretary, that the admirable inquiries into the condition of hospitals and jails throughout the State, does not meet with as full and complete a response in every instance as could be wished, although it is to be hoped that county authorities will hereafter be more careful in these particulars. About 16 pages of the volume are occupied with an account of the various outbreaks of smallpox and the measures adopted to prevent the spread of this disease. Considerable space is devoted to the subject of railroad inspection and quarantine, an instructive example of the latter occurring at Truckee being minutely detailed.

An appendix, which constitutes nearly half the book, is made up in the usual way of papers contributed by physicians and others interested in sanitary subjects. In the first of these, "On the Southern California Channel Islands as Health Resorts," Dr. J. P. Widney claims that their peculiar merit is, that while lying within the line of a semi-tropical climate, they are entirely exempt from the scourge of yellow fever and the ordinary Southern diseases; and their comparatively small size and their distance from the mainland save them from strong sea-breezes and coast fogs, and secure for them a remarkably equable temperature. Brief *résumés* of opinions from leading sanitarians upon their respective subjects are given in articles on "Sanitation in Schools," by Dr. C. W. Breyfogle; on "The Pollution of Rivers," by Dr. F. W. Hatch; and on "Factories as Sanitary Agents," by Dr. J. P. Widney; Dr. F. W. Hatch also contributes a valuable paper on "The Seaside Health Resorts of California," in which he gives the usual preference to Santa Barbara, and San Diego, and which

is well worthy the careful perusal of any intending visitor to or prescriber of this delicious climate. In the following essays Dr. Breyfogle pleads for the establishment of a State inebriate asylum; Dr. W. R. Cluness complains bitterly of the "Animal Food we Eat," urging most judiciously the more thorough inspection of animals, both before and after they are slaughtered; and Dr. H. Gibbons concludes with the oft-told tale of human ills depending "On intoxicating drinks." J. G. R.

ART. XXXIII.—*A Supplementary Catalogue of the Pathological Museum of St. George's Hospital: A Description of the Specimens added during the Years* 1866–1881. By ISAMBARD OWEN, M.D., Curator. 8vo. pp. xxxiv., 284. London: J. & A. Churchill, 1882.

CATALOGUES in general, like dictionaries, are not regarded as interesting reading, and this criticism is just in most cases. They are devoid of the plot of the time-honoured novel, and the subject changes too frequently for a sustained interest. All this is true of most catalogues, but we claim a most decided exception in the case of a well-made catalogue of a pathological museum. We claim an especial exception in favour of the catalogue before us.

The well-written catalogue of a carefully selected museum is sure to carry the reader back to the hours of work spent in the dead-house, the laboratory, and the museum, and how full of suggestions are the brief clinical histories appended to the specimens! No one can take up such a catalogue, even for a moment's glance, without being instructed in one's daily routine of medical practice. Such at least was our experience with the volume before us while cutting its pages, and still further instruction was gained after a careful study of its contents.

No one knows, until he has put pen to paper, how difficult a task it is to make a good catalogue. The writer of such a volume is, perhaps, the least competent person to judge of the value of the work when it is completed, so that we feel it especially incumbent on us to express our satisfaction from an examination of the one before us. Knowledge of the subject and familiarity with the specimens do not insure a good result, and it is not always the graphic and picturing pen which makes the most interesting, and at the same time useful, catalogue of a museum.

A photograph (in words) will not replace the knowledge to be obtained from an examination of the specimen; therefore the description should not go beyond the points which assist the student in his examination, but all the leading features must be stated by which the examination is to be guided. In respect to the history of the patients, it is difficult not to exceed the limits which furnish the essential features of a case—beyond this limit the details of the cases become tedious reading. Here in this catalogue, as should be the case in every good catalogue, references are furnished for the post-mortem records and case-books of the Hospital, and also to the periodicals and transactions of various societies in which records of the cases have occasionally appeared.

In the catalogue of 1866, of which the present volume is a supplement, the specimens were numbered continuously in series (I. to XXII.). In this catalogue the notation has been changed to the simple continuous index numbers (with a system of double numbers in reference to the old serial numbers).

The system of continuous or consecutive numbers for museum specimens, especially for pathological material, is, we consider, a most unfortunate one in every respect. As the author of this catalogue says, the numbers "are liable to change on each rearrangement," and with this system of notation, rearrangement becomes necessary at frequent intervals in every growing museum. Otherwise the specimens become so confused that they are difficult to find on the shelves.

Some one owes the debt to museums and the makers of their catalogues, of framing a system of notation, which is perpetual—a notation which never runs out. As an illustration of such a system, let us take an example of the liver. It is quite an easy matter to make a list of all the changes and morbid conditions of this organ. To each of these attach a principal number. The individual specimens under each group are indicated by a coefficient number. Thus, abscess of liver, principal number 1385. Of the various abscess formations, let us commence with the pyæmic; the first specimen is numbered 1385, the second 1385^{5}, the third 1385^{10}, and so on. The tropical, or solitary abscesses receive the same principal number 1385, but their coefficient is made, to suit the requirements of the case, at $\frac{100}{}$, Abscesses from obstruction of the duct have likewise the same principal number 1385, with the coefficient $\frac{200}{}$. Should the number of specimens of pyæmic abscess in time exceed 100, a coefficient number can be employed thus $1385^{\frac{10}{}}$ and so on. Practically this duplication of coefficient numbers need not occur, if, at the beginning, sufficient spacing of the principal numbers has been provided for all known possibilities; unless by the retention of every specimen the museum is allowed to become a mere storehouse of duplicates.

This system of notation does not show at a glance the actual number of specimens on the shelves, as is the case by the continuous or consecutive system. The gross number of specimens must be shown by the curator's manuscript catalogue or museum blotter. This defect is, however, but a small fault considering the great advantages which the system in other respects affords. The system is very useful in indicating at a glance in what special directions the museum is deficient and in what class of specimens it is strong—points at which every curator has need of increased facilities.

The general appearance of the volume is very creditable to the editor and the hospital authorities. M. L.

ART. XXXIV.—*A Rational Materialistic Definition of Insanity and Imbecility, with the Medical Jurisprudence of Legal Criminality, founded upon Physiological, Psychological, and Clinical Observations.* By HENRY HOWARD, M.R.C.S. Eng., for the last twenty-two years connected with Asylums for the Treatment of the Insane; an Ex-President of the Montreal Medico-Chirurgical Society, etc. 8vo. pp. 145. Montreal: Dawson Brothers, 1882.

THE title of this book is appalling. A "Definition of Insanity and Imbecility," etc., without the reverberant prefix "Rational Materialistic," might, we think, have answered. The theoretical portion of the volume is a strange admixture of pathologies, mediæval and modern. Sensation, according to our author, is due to the electric or vital fluid that is generated in the nerve cells of the skin, which nerve fluid is conducted by

means of the sensory nerves to the brain by molecular motion. The electric vital fluid becomes turbid or opaque, causing insanity. The germ theory is not forgotten. "It requires no very great stretch of our imagination," says Dr. Howard, "to conceive a germ in the fluid of the afferent nerves propelled by molecular motion to the organ of consciousness, and, while remaining in that organ, producing violent mania, said mania subsiding when the germ by the same process becomes removed from the organ of consciousness." Verily we have here the hint to an investigation worthy of the genius of a Koch or a Formad!

A large part of the book is taken up with a discussion of the case of Hayvern, a Canadian convict, who murdered another convict named Salter, and for whom was set up the defence of epileptic insanity. Dr. Howard testified for the defence, and made out a good case for the accused. He has evidently had a large experience with the insane; and we would accord to his clinical and medico-legal investigations in psychiatry a much higher place than we have to some of his theoretical notions about the pathology of insanity. Much of his advice to experts is admirable. He shows that Hayvern was hanged as Guiteau was hanged—to appease society. In the trials of both, the barbarous doctrine was held that a knowledge of right and wrong should be made the touchstone by which to test sanity or insanity. We venture the opinion that one State hospital will more than hold all the insane of Pennsylvania who cannot discern between right and wrong.

The great questions of crime and responsibility cannot too often be brought before the profession, when those presenting them give evidence of some practical familiarity with their subjects.

Dr. Howard's monograph is enlarged by the reproduction in full of an article by Prof. William Osler on *The Brains of Criminals*, and another by Dr. James G. Kiernan on the *Medico-Legal Relations of Epilepsy*, and also by remarks of Dr. Hack Tuke and others; but, as the ballast in this case is valuable, we do not think that the reader need make complaint.

C. K. M.

ART. XXXV.—*The Student's Hand-Book of Forensic Medicine and Medical Police.* By H. AUBREY HUSBAND, M.B., C.M., F.R.C.S.E., M.R.C.S., Lecturer on Medical Jurisprudence and Public Health in the Extra-Academical School, Edinburgh; Member of the General Council of the University of Edinburgh, etc. etc. Fourth and revised edition. 12mo. pp. 604. Edinburgh: E. & S. Livingstone. London: Baillière, Tindall & Cox, 1883.

THIS volume constitutes one of a series of medical hand-books, which of late years have become so much the fashion, both abroad and in our own country. In the medical schools of Europe, where the number of subjects required of the student for examination, before attaining his degree, is larger than with us, the question of *condensation* becomes to him a matter of vast importance. Hence the growing demand for manuals, hand-books, vade mecums, and other short-cuts to the desired end, containing the *multum in parvo*.

The fact that the present volume has reached the fourth edition speaks well for its merits. That so comprehensive a subject as medical jurisprudence, including also toxicology, should be discussed within so small a

compass, and well discussed too, so far as the limits will allow, is certainly no small praise for the author. We have looked through the different topics presented with some degree of attention, and find in each all the really practical important points treated in the tersest possible style. Certainly, there is no waste of words on the author's part. But the question is, can the student of forensic medicine thoroughly master this science by perusing such a work as the one before us? We think not. Whilst it may serve as an admirable *résumé* of facts to the veteran in this branch of knowledge, we think the beginner would be perplexed and discouraged in his investigations, from the want of proper elaboration of the subject. We notice, under the head of blood-stains, that no allusion is made to the possibility of distinguishing human blood-corpuscles from those of our common domestic animals, the ox, horse, sheep, and hog, as has been demonstrated by Prof. Richardson of our own city.

Other criticisms might be made in reference to omissions under various headings, but we incline to attribute these to the limited space allotted to the author. This, however, makes it only the worse for the student.

More than one-third of the work is devoted to the consideration of *medical police*, a subject pertaining to the domain of hygiene rather than to that of medical jurisprudence. This will be sufficiently apparent when we enumerate some of the topics discussed under this head: Mortality of the two sexes as influenced by locality, seasons, professions, marriage, prostitution, civilization, and intemperance; vital statistics; expectancy of life; ventilation; meteorology; climatology; temperature; winds; sewerage; water; food; clothing; epidemic diseases; and cemeteries. Whilst a proper knowledge of all the above subjects is confessedly important to the student of hygiene, we submit that they can hardly claim a place in a treatise on legal medicine. J. J. R.

ART. XXXVI.—*A Guide to the Practical Examination of Urine.* By JAMES TYSON, M.D., Prof. of General Pathology and Morbid Anatomy, University of Pennsylvania, etc. etc. Fourth Edition. Revised and corrected. Philadelphia: P. Blakiston, Son & Co., 1883.

"IF it be true that a good wine needs no bush," it is equally true that a volume of such universally recognized merit as this one needs no further commendation from a reviewer.

The improvement in the fourth edition consists in the elaboration of the articles upon albumen and sugar, and the addition of some concise paragraphs upon fibrin and globulin.

The article upon sugar has been much improved by a critical review of the accuracy of the tests in most common use, especially the copper and bismuth tests. The author remarks on the subject of the qualitative testing of urine, suspected to contain sugar, as follows:—

"When I say Trommer's test is a reliable test in my hands, I do not mean that it will detect the minimum of sugar recognizable in aqueous solutions. I mean that I can detect such quantities of sugar as are of clinical significance. With all tests there are certain very evident reactions, and certain doubtful ones, and to interpret these last, experience must often be relied upon." E. T. B.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

The Nerve-centre of the Uterus.

At the meeting of the Société de Biologie, held Dec. 23, 1882, M. Pembo read a paper, in which he stated that the contractions of the uterus are regulated by automatic nervous ganglia situated in the anterior wall of the vagina, and independent of the cerebro-spinal axis; other auxiliary centres probably also exist in the uterine appendices. The presence of these centres is demonstrated by the appearance of uterine contractions when these situations are stimulated by the electric current. M. Pembo has also been able to demonstrate anatomically the existence of ganglion cells at these points.

M. Paul Bert believed, on the following grounds, that the influence of the spinal centres in producing uterine contraction could not be excluded; for when the spinal cord is divided in the lower dorsal region in a female rat, and asphyxia then produced, the uterus can be felt to contract; but if the lower segments of the cord are destroyed and asphyxia then produced, no such contractions take place.—*Le Progrès Méd.*, Jan. 6, 1883.

Saccharifying Power of the Saliva.

M. A. Béchamp, in an article contributed to the first number of Brown-Séquard's *Archives de Physiologie* for the present year, after commenting upon the circumstance, at one time considered remarkable, that whilst the saliva of man possesses the power of converting starch into sugar, no such power is exerted by the saliva of the horse, dog, or ox, undertakes to show—first, that human buccal saliva is not indebted for its diastatic power to any alteration effected by the air on the various immediate organic principles which are secreted by the glands and discharged into the buccal cavity; secondly, that the power of converting starch into sugar belongs to a peculiar and special zymase which is contained in the saliva, and that this zymase is the outcome of the action of the microzymes proper to the salivary glands, of the microzymes of the anatomical elements which line the buccal cavity and the tongue, and of the microzymes and infusory animalcules that accumulate in the interstices of the teeth. Lastly, that the parotidean saliva of the horse and that of the dog do not saccharify boiled starch naturally, but

that they acquire this power when they are placed in contact with the buccal organisms of man. In the course of these experiments he found the buccal infusory animalcules to have an extraordinary power of converting starch into sugar, one-thousandth part of a gramme of the matter adherent to the free border of the gums of a healthy man, after being frequently washed with a weak solution of creasote, acting powerfully on starch paste. This material was formed of the débris of epithelial cells, of numerous molecular granules, and of many moving or stationary short or long bacteria (probably segments of Leptothrix buccalis), and no doubt some remains of food. The buccal organisms or granules are the bodies he endeavours to show are the really active bodies, for he has accomplished the removal of the other elements, and found the saliva of man still to retain its powers, and he supplies evidence to show that they are not identical with the bodies which develop in the saliva either of man or of the animals named after removal from the body and filtration.—*Lancet*, January 27, 1883.

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Gastric Digestion under Various Influences.

Probably most, if not all, medical men are pretty strongly convinced of the injurious effects of a large draught of fluid taken along with meals, and act upon that conviction in laying down dietaries for their dyspeptic patients. At the same time we are not aware that any very accurate observations have been made on the point, and therefore a short account of the results obtained by Dr. FLEISCHER on this and kindred points (*Berl. Klin. Woch.*, 1882, No. 7) will not be void of interest. The first point in Dr. Fleischer's method was to ascertain for the healthy stomach the limits of the period of digestion for a given diet, that chosen being in almost all cases soup, bread, and beefsteak each day, alike in quantity and quality. At twelve o'clock this food was given, and six to seven hours later the stomach was washed out by means of a stomach-tube. The result showed that while for the same individual the digestion period was tolerably constant on successive days, for different individuals the period varied between five and a half and seven hours. The digestion period having been fixed, the same diet was given next day, but along with it half a litre to a litre and a half of water was drunk. At the same hour as on the previous day the stomach-tube was introduced. The result showed that there are healthy stomachs in which the drinking of cold water along with a meal, even to the amount of a litre and a half, produces no change whatever. In the great bulk of cases, however, it appeared that in a healthy stomach half a litre has no effect, a second half-litre causes a slight prolongation of the digestion period, while a third half-litre causes a distinct prolongation. A patient affected with moderate dilatation of the stomach and a slight catarrh completed the digestion of a given diet within seven hours when no water was taken. With half a litre of water the digestion was a long way from completion at the end of seven hours; while on the following day, when no water was taken, at the end of seven hours the washings of the stomach were almost quite clear. Having ascertained that digestion goes on equally rapidly whether the person lies quiet in bed or is up, Dr. Fleischer tried the effect of several hours' smart walking after meals. In some cases the digestion period was not prolonged by this, but in the great bulk of cases it was distinctly so; thus justifying the old rule, "After dinner sit awhile." In regard to the effect of heat on digestion, Dr. Fleischer made careful experiments, and in the great majority of sound stomachs he found that by the application of warm poultices over the stomach for five to six hours immediately after a meal, the digestion period could be shortened by about an hour. Cold seemed to have no effect whatever. As to the administration of pepsine and dilute hydrochloric acid to assist digestion, Dr. Fleischer finds that neither drug has any effect whatever in

healthy stomachs, or in the case of patients with dilatation of the stomach and moderate catarrh, where free acids had been found previously in the washings of the stomach. This result, Dr. Fleischer points out, is not contradictory to those of Professor Leube, who found that in his patients with chronic gastric catarrh, digestion was distinctly improved by the use of these drugs. In Professor Leube's cases the gastric juice was deficient, while in Dr. Fleischer's it was secreted copiously. Dr. Fleischer confirms Kretschy's results as to the retardation of digestion by menstruation, and the return to the normal on the cessation of the menses. The preceding results give certain indications for treatment. They justify us in forbidding the consumption of a large amount of fluid, more especially cold water, at meals; and they also show that after dinner a period of rest is advisable. Dr. Fleischer had previously watched the good effect of poultices in cases of ulcer of the stomach, and he believes that this arises not only from their soothing influence, but also because the process of digestion is hastened, and so the stomach has a longer period of rest. If the stomach washings contain free hydrochloric acid, it is useless to give more; but in all dyspeptic cases it is well to give pepsine, as we can never be sure that that substance is not deficient.—*Med. Times and Gaz.*, Nov. 25, 1882.

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The Physiology and Pathology of the Stomach.

Dr. Ludwig Eringer (*Deutsch. Arch. für Klin. Med.*, Band xxix. Heft 5 and 6) has made a large number of experiments on himself and on many other persons, to decide at what time during the state of digestion free hydrochloric acid appears in the gastric juice. He found that the latter contained an excess of free hydrochloric acid during the third and fourth hours after an abundant and rich meal.

Examination of the gastric juice, in a case of typhoid fever, elicited the fact that the masses vomited during the period of the highest fever contained a large amount of free hydrochloric acid. As the results so far gained in this direction have been contradictory, this new addition to the chemistry of the digestion of persons suffering from high fever is rather important.

Examinations into the amyloid degeneration of the stomach showed, in eleven cases, that the vessels of the walls of the organ were also affected, more or less, by the same process of degeneration; frequently the muscular coat, especially the muscularis mucosæ, often a part of the areolar tissue of the mucous membrane and the glandular structure, participated in the same morbid alteration.

Dilatation of the stomach is brought by the author into causal connection with the coexisting considerable amyloid degeneration of the muscular walls of the organ. If the latter no longer possess the tonus which is necessary to enable them to carry the weight of the contents of the stomach, passive dilatation, its degree depending upon the amount of the contents, will temporarily ensue, and gradually change into permanent dilatation, as the peristaltic movement becomes less and less sufficient for the locomotion of the contents of the organ.

Concerning the development of ulceration in cases of amyloid degeneration, the fact was noted, that it is not the amyloid parts which are attacked by this ulceration, but those parts which are not suffering from amyloid degeneration, but which, not being provided sufficiently with blood from the degenerated vessels, fall a victim to the destroying influence of the gastric juice, which only an ample supply of alkaline blood can prevent. The physiological function of the stomach in cases of amyloid degeneration of the vessels of the mucous membrane of the organ undergoes this change, as proved by the frequently repeated examination of the contents of the organ in five such cases; that the gastric juice, at the proper time, exhibits a want of free hydrochloric acid.

Regarding the symptoms during life by which the physician, under certain circumstances, may be able to recognize this participation of the stomach in the amyloid degeneration, Dr. Frerichs first drew attention to the fact that in the beginning the appetite vanishes, and, from time to time, vomiting takes place, while the tongue is not coated. But Dr. Eringer contends that these symptoms are so little definite, and subject to such diverse explanations, that they can hardly be considered as possessing any diagnostic value. According to Dr. Eringer's experience, amyloid degeneration of the vessels of the stomach by itself does not exert any influence at all on the appetite. Vomiting, with clean tongue, absence of tenderness in the epigastric region, and amyloid degeneration in other organs, are the symptoms mainly to be relied upon. The favourable action of acids, and especially of hydrochloric acid, in cases of typhoid fever, seems to receive an explanation by the facts above mentioned; and the latter give the hint not to administer acids, for the purpose of assisting digestion, immediately after a meal, but about two hours after the same.—*London Med. Record*, Dec. 15, 1882.

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The Functions of the Pancreas in Fever.

Dr. STOLNIKOW, of St. Petersburgh, gives, in a communication to Virchow's *Archiv*, the results of his observations on the changes in the activity of the pancreas in fever. He refers, in the first place, to the well-known disturbances of the digestive organs that accompany and characterize febrile states of the system; to the thirst, dryness of tongue, nausea, loss of appetite, and abdominal pain; to the changes in the salivary secretion observed by Mosler, such as the deficiency in its quantity, its acid reaction, the absence of sulphocyanide of potassium and of the diastatic ferment, so that it is incapable of converting starch into sugar; and again to the changes observed by Manassein in the gastric juice, which, like the saliva, is diminished in quantity, and so altered in properties that it cannot exert its proper digestive power. But he says few or no attempts have been made to trace the changes occurring in the pancreas and its secretions, though there are good *a priori* grounds for believing that corresponding changes would occur. As the pancreas secretes a fluid containing powerful diastatic and fat disintegrating ferments, as well as a ferment acting on albumen, the inquiry has a special interest for Russian physicians, since many of the inhabitants of the more remote provinces are chiefly fed on starches and fats. In his experiments he first made a pancreatic fistula in accordance with the directions in Cyon's "Methodik," and after ascertaining the normal mode and kind of secretion, he injected putrilage into the dog on which the investigation was made. The result was that the quantity of the pancreatic secretion was at first augmented to a considerable extent, the rise being from 2–3 c.c. per hour to 70–79 c.c. per hour. This effect was brief, and was followed by diminution, and when the quantity had diminished the increase usually observed after the ingestion of food failed to occur. The cause of the increase in quantity he considers to be excitation of the secretory nerves of the gland by the septic poison; its subsequent arrest he attributes to the paralysis of the nerves, the septic poison in fact acting in the same manner that atropia does on the nerves of the salivary glands. In regard to the quantity of the special ferments contained in the pancreatic juice, they also would appear to be at first augmented and then diminished, the diminution being occasioned by the depressing influence exerted by the septic poison both upon the trophic nerves and upon the cells themselves, in which pathological processes are established. The influence of the fever in producing a persistent depressing effect is greatly in excess in its duration over its exciting effect, and hence he considers that the employment of pilocarpin in fever has a logical foundation.—*Lancet*, Jan. 6, 1883.

MATERIA MEDICA AND THERAPEUTICS.

The Anæsthetic and Diuretic Action of the Stigma of Corn.

Dr. Ducasse has been employing an extract of the stigma of corn (*Stigmates de mäis*) in doses of from one to two grammes daily, in cases of chronic cystitis and gravel and nephritic colic with the most satisfactory result, as regards relief of pain and irritability of the urinary passages. He has also been able to confirm the following conclusions by Dr. Sandrieux of its diuretic properties. The latter found that when administered under any form, it causes in three or four days a marked increase in the quantity of urine, and that these effects were produced not only in diseases of the urinary organs, but also when the normal quantity of urine had been reduced from disturbance in the organs of circulation. It does not produce any disturbance of the nervous or digestive system, even when its administration in large does has been long continued.—*L'Union Méd.*, Dec. 7, 1882.

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Physiological Action of Convallaria Maialis.

Dr. Isaac Ott draws the following conclusions from an experimental study with this drug:—

1. That convallaria increases the arterial tension greatly at the same time as the heart begins to beat more frequently; that the heart begins to fail before the tension.

2. The decrease of cardiac frequency is not due to cardio-inhibitory excitation, but to an action on the heart itself, probably on its muscular structure.

3. The rise of arterial tension is mainly due to stimulation of other vaso-motor apparatus than the main monarchical vaso-motor centre.

4. The drug causes clonic spasms.

If we compare the action of this drug with digitalis, it is found that the slowing of the heart by each is due to different causes: with digitalis it is due to a cardio-inhibitory excitation; with convallaria some other part of the heart is acted on. Digitalis, as a rule, does not primarily accelerate the heart; convallaria does. After section of the spinal cord digitalis is powerless to increase arterial tension, whilst convallaria is not. If now we compare the action of this drug with other cardiac agents, as aconite, urechites suberecta, or astragalus mollisimus, it is found that it does not belong to this group. As aconite, urechites, and astragalus resemble each other in their action, yet many important differences exist, so does convallaria differ from digitalis in several important particulars. The great rise of arterial tension would indicate its value in dropsies, reasoning upon Ludwig's theory of renal secretion. It is a drug which must not be pushed to any great extent.—*Archives of Medicine*, Feb. 1883.

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Chrysophanic and Pyrogallic Acids.

At the meeting of the New York Dermatological Society, held Sept. 26, 1882, Dr. P. A. Morrow formulated the following propositions:—

1. That chrysophanic acid is perhaps the most efficient agent known to the profession for the external treatment of certain cases of psoriasis, especially chronic cases which have resisted other methods of treatment.

2. That its range of application is limited; in children, in patients with sensitive, irritable skins, and in acute cases generally, it is contra-indicated.

3. That in psoriasis affecting the face and hairy scalp, its intensely irritating action, producing puffiness of the face and eyelids, and its discolouring effect upon the hair render its employment impossible.

4. That it is prompt in its action—a week or ten days' active treatment being usually sufficient to develop its full therapeutic efficacy.

5. That the curative effect is only temporary; it does not afford a safeguard against relapses.

6. That it probably acts only locally and by virtue of its irritating properties, setting up a substitutive inflammation, which modifies or corrects the tendency to the inflammatory overgrowth of epidermic cells.

7. That its employment is attended with certain objectionable results, some of which always follow its use, while others seem to depend upon idiosyncrasy, physiological and morbid predispositions, etc.

8. That a brownish, prune-juice discolouration of the skin which persists long after the application is discontinued, a reddish staining of the hair and nails, and an indelible dyeing of the clothing are inseparable from its use.

9. That the erythematous and furuncular inflammations which occasionally follow its use may be classed as incidental effects, as they do not always depend upon an excessive strength of the preparation employed, but are frequently manifest after a mild application—intense dermatitis resulting in exfoliation of the epidermis in large flakes, has been observed after an application of 10 grs. to the ℥j.

10. That the strength of the ointment recommended by Balmanno Squire (℥ij. to ℥j.) is excessive; a milder strength (20 grs. to ℥j. to ℥j.) being usually sufficient to develop the full therapeutical virtues of the drug.

11. That in other diseases for which it has been recommended, as acne, favus, chromophytosis, eczema marginatum, etc., chrysophanic acid possesses no advantages over certain other drugs which are commonly used.

12. That pyrogallic acid is a drug which is free from some of the more objectionable features of chrysophanic acid. It does not (in 10-per-cent. ointment) inflame the skin, it does not produce œdema of the face when applied to the scalp, and the discolouration is much less marked and permanent.

13. That it should nevertheless be used with caution, as pernicious results have followed its too free use. When freely used for two or three weeks, it produces an olive-green or tarry condition of the urine, with prostration, febrile disturbance, and other general symptoms.

14. That its curative action in psoriasis is much less rapid, but apparently more permanent than that of chrysophanic acid.

15. That its freedom from irritation, and its absence of odor, renders it an admirable substitute for chrysophanic acid and oil of Cade in diseases affecting the scalp and face.

16. That while its effect in psoriasis is slower and less brilliant than that of chrysophanic acid, its range of therapeutical action is much more extended. It causes to disappear the nodosities of lupus, the hyperplasias of syphilis, epidermic and papillary hypertrophies, and seems to have a good effect in promoting the cicatrization of wounds.

17. That it seems to act by virtue of its stimulant and irritating properties, it hardens and shrinks the tissues, shrivels up unhealthy granulations, and acts as a hæmostatic.—*Journ. of Cutaneous and Venereal Diseases*, Nov. 1882.

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The Absorption of Certain Salts from the Alimentary Canal.

In a series of papers on the Action of Saline Cathartics, which are at present appearing in the *Journal of Anatomy and Physiology*, by MATTHEW HAY, M.D., was drawn attention to a remarkable peculiarity in the absorption of sulphate of soda from the alimentary canal. He there states (vol. xvi. p. 568), as

the result of a number of experiments—in which a purgative dose of the salt was administered to fasting cats, and the animals killed at various intervals afterwards, and the quantity of salt recoverable from the alimentary canal estimated—that, during the first hour after the administration of the purgative, the salt is rapidly absorbed, until nearly one-half of the whole dose (five grammes) disappears from the canal, whilst during the next hour the greater portion of the absorbed salt returns to the canal. The quantity of the salt was estimated from the quantity of sulphuric acid recoverable, which was precipitated in the usual way by means of barium sulphate from an acid solution of the ash of the dried contents of the canal. He has ventured to explain the peculiar course of the salt by suggesting that the rapid absorption occurs in the small intestine, and the excretion in the large intestine. A more detailed explanation will be found in the papers referred to.

Since these experiments were made, he has recently instituted others for the purpose of ascertaining if other purgative salts behave in a like manner to sulphate of soda, and if the base as well as the acid of each salt be similarly absorbed and excreted; for, as mentioned, it was only the acid of the sulphate of soda which he estimated. The other salts employed in the present experiments were the sulphate of magnesia and the phosphate of soda.

The results of the additional experiments with the sulphate of soda showed that, although the acid is rapidly absorbed during the first hour of the action of the salt, the base is not. For example, after the administration of five grammes of sulphate of soda to a cat, which was killed one hour afterwards, there were recovered from the contents of the alimentary canal, mixed with an infusion of the canal-wall, 2.544 grammes of sulphate of soda as reckoned from the sulphuric acid present, and 4.877 grammes of the salt as reckoned from the soda present. Other experiments performed in the same manner yielded like results. If the cat were killed two hours afterwards, nearly four grammes of the salt were recovered, as estimated from the acid, and about four grammes and three-quarters, as estimated from the base. After a longer period, the acid and base gradually became less.

The experiments with sulphate of magnesia yielded much the same results as those with the soda-salt. The acid rapidly disappeared from the canal during the first hour after the administration of the salt, and even to a greater extent than in the case of the sulphate of soda. As also with the latter salt, the acid returned to the canal, but not quite so rapidly as the acid of that salt. At the end of the second hour, there was hardly more of the acid in the canal than there was at the end of the first hour; but, by the completion of the third hour, the quantity had considerably increased. Meanwhile, the base or the magnesia was very gradually undergoing absorption, and never at any time during the first few hours after the administration of the purgative, was there evidence afforded of the base having pursued the same peculiar course of absorption and excretion as did the acid.

In his paper on the Action of Saline Cathartics, he pointed out that one-fourth part or less of a purgative dose of sulphate of magnesia will, when injected into the circulation of a dog or a cat, kill it; and he, at that time, remarked that, if this salt were absorbed into the blood in the same manner and to the same extent as the sulphate of soda, it was very strange that it did not exert its toxic action. He did not then know that the acid was absorbed, whilst the base, for the most part, remained in the canal, or was absorbed only very slowly. The present experiments, therefore, offer a very satisfactory explanation of the difficulty he formerly experienced. The salt is split up in the canal, and the basic or toxic part of it enters the blood very gradually, and not more rapidly than it can be excreted by the kidneys.

The remaining experiments were made with the phosphate of soda, to observe if the phosphoric acid of this salt might behave in the same way as the sulphuric acid of the sulphate. The experiments were only two in number, in one of which the cat was killed after one hour, and in the other at the end of two hours. In both the quantity of phosphoric acid recovered from the alimentary canal and its contents was large, and did not exhibit any evidence of the same primary rapid absorption as of the sulphuric acid. The phosphoric acid was, however, more reduced in quantity than the base, and it is probable that, to a certain extent, the phosphate undergoes decomposition in the canal.

How the splitting-up of the sulphates in the intestines is effected, and in what combination the acid passes into the blood, is beyond the scope of the present communication.—*Brit. Med. Journ.*, Dec. 16, 1882.

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Transfusion.

The question of the treatment of cases of excessive loss of blood by means of injections of alkaline solutions of common salt must be held to be well worthy of consideration. Schwarz wrote on the subject in 1881, recommending this method of treatment as a safe and rapid means of saving life, and a review of his book will be found in our pages for December 17, 1881; and he has since made a further contribution to the subject (*Berliner Klinische Wochenschrift*, 1882, No. 35); and in the *Deutsche Medizinal-Zeitung*, No. 46, is an abstract of two cases by Kümmell. The advantages that a simple non-coagulable and easily prepared fluid possesses over even defibrinated blood cannot be too highly estimated; and if, as is maintained, the real want of patients suffering from acute anæmia is not so much blood-disks as blood-pressure, the employment of an ordinary salt solution presents an easily prepared agent ready to hand in all emergencies. It is obvious, however, that a trustworthy conclusion as to the value of the proposed remedy can only be arrived at by its practical employment. Schwarz recommends intravenous injection of the fluid as in ordinary blood-transfusion. In both Kümmell's cases the solution was thrown into the radial artery—*i. e.*, the intra-arterial method of Bischoff. In the first example the transfusion was resorted to for hemorrhage after the operation of nephrectomy; a 6 per cent. solution of chloride of sodium made alkaline by a few drops of caustic soda was injected to the amount of about 160 grammes, at a temperature of about 40° C., and at a pressure of about one metre. The immediate effect was recovery from the collapsed condition, but the patient died the next day in consequence of disease of the other kidney. In the other case, in which the operation was performed on account of acute anæmia due to hemorrhage from a resected knee, about 500 grammes were introduced, the pressure not being measured. The heart was in a weak state. The general effect was all that could be desired, but a swelling in the hand was noted, which was no doubt due to rupture of capillaries by the force of the injection; this swelling diminished, but gangrene of the hand set in, which necessitated amputation of the forearm. In the part cut off, thrombosis of the ulnar artery was found. The mummification was attributed to the combined action of the high pressure at which the fluid was injected, and the cardiac debility, aided by the anatomical arrangement of the vessels in the hand. The author comes to the conclusion that it is better to open the median basilic vein than to use the intra-arterial method. There seems to be some ground for believing that intra-venous injections of solutions of common salt, properly performed, have been occasionally of real life-saving value; or, at least, that enough encouragement has been met with to justify a more extensive trial of this method of treatment.

In the same number of the *Deutsche Med. Zeitung* an abstract of some remarkable observations by Giulio Dozzi is given. Two cases are mentioned in which blood was transfused into the cavity of the peritoneum, one of which ended fatally in twenty-four hours, the other after ten days. Unfortunately, no other particulars are given. This operation has been done twenty-seven times in Italy, four times with fatal ending; and in two cases there was complete restoration to health. The apparent benefit from this proceeding was in most cases not lasting; and the operation had to be repeated at definite intervals, which, as the earlier cases seemed to give rise to no dangerous symptoms, it was thought could be safely done. But the good results in the first cases were not maintained. It would appear from what follows that the intra-peritoneal injection was used to overcome the anæmia of chronic affections, for, looking to the lessening success of this method of treatment, Dozzi asked himself whether the introduction of similar quantities of blood into the intestinal canal might not be productive of less brilliant but more useful results. Four cases were experimented on. The first was a boy aged thirteen years, brought very low by pellagra; a litre and a half of blood was injected eight times in a fortnight, with complete restoration of health. The second instance was of much the same kind, and eleven enemata of blood were given. The third was the case of a woman aged forty years, suffering from splenic leukæmia; here twenty-eight injections were given in two months; the patient greatly improved, and the spleen was reduced in size. The last was also a case of leukæmia, in which thirty introductions of blood were performed, with slow but sure improvement, the spleen lessening in size, and finally the blood returning to its normal state. The blood, injected by an enema apparatus, was taken from sheep or oxen whilst being slaughtered; it was defibrinated, and kept warm, if necessary, in a water-bath, the quantity used varying from one litre and a half to two litres. The patient gradually became able to retain this large quantity. We are warned that too much pressure must not be used, lest the blood should get into the higher parts of the alimentary tract, where it would be rather digested than absorbed. In this country we know practically nothing of the intra-peritoneal method of injection, but we should have thought that the procedure could scarcely be regarded as beneficial, or even as harmless. Enemata of blood may be nutrient, but they cannot be called transfusions in the ordinary sense of the term, and we confess to a doubt whether blood can be simply absorbed, even from the large bowel; further, this method of treatment was practised on cases widely different from those of acute anæmia. If such modes of administering the blood of animals be of therapeutical value, they probably are not so by such direct means as Dozzi seems to suppose. Moreover, because diseases get well whilst a certain treatment is in progress, the success need not depend on that treatment. Lastly, the facts given are not sufficient to prevent some doubt of the accuracy of the diagnosis of splenic leukæmia in the above instances.—*Med. Times and Gaz.*, Jan. 20, 1883.

MEDICINE.

Rare Complications of Enteric Fever.

Abscess in the liver, occurring in the course of typhoid fever, has been recorded once by Hudson, and pyæmic deposits have been noticed once each by Louis and Frerichs. Murchison has seen a yellowish substance in the liver,

probably of the nature of an infarct. Von Sidlo has put on record a probable case of hepatic abscess. So far as we know, these are all the instances in which this affection has been observed as an epiphenomenon in the course of what the Germans call "abdominal typhus." A fresh example is afforded by the publication of a case (*Berliner Klin. Woch.*, No. 51) by Dr. Asch, late assistant at the Strasburg Clinic for Children. If the hepatic disease be uncommon in adults, it appears to be even more so in children. Von Sidlo's case affected a girl aged ten years. The present example occurred in a boy aged twelve years, who suffered from a fairly severe attack of enteric fever. The course of the affection was of the usual uninterrupted character until the twenty-first day, when vomiting occurred, and this symptom was repeated on the next few days. On the twenty-seventh day of the illness there was a sharp rigor with a high temperature (106° Fahr.); this was followed two days later by severe pain in the right of the epigastrium; there was much tenderness just below the right costal margin, and here there was evidently a tumour whose characters it was not easy to diagnose owing to the hyperæsthesia. No fluctuation was felt; the spleen was not enlarged; there was no jaundice, nor any fulness of the epigastric veins. The rigor was not repeated. There was hectic fever with profuse sweats and faintings. Death happened on the thirty-fifth day of the disease. According to the reporter, the diagnosis lay between loculated purulent peritonitis and hepatic suppuration. The post-mortem examination revealed typhoid ulceration of the intestines which had healed; suppuration of the lymphatic glands in the neighbourhood of the ileo-cæcal region; and several (eight to ten) pyæmic abscesses in the right lobe of the liver, purulent infection having doubtless spread along the mesenteric veins into the hepatic ramifications of the portal system. Opponents of the doctrine of infection would probably interpret the suppuration as a spontaneous formation of pus due to general conditions, but we think the infective view much more likely to be the true one in this case.—*Med. Times and Gaz.*, Jan. 6, 1883.

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Orchitis in Typhoid Fever.

Orchitis is one of the rarest complications of typhoid fever. So uncommon is it that its occurrence is not even mentioned in Murchison's classical account of the disease. Nevertheless a good many cases have been lately recorded. An instance (of doubtful nature) was described by Bouchut in 1867; and Dr. Duffey observed in the same year, at Malta, no less than eighteen examples of this complication of Maltese fever. Since then a number of cases have been observed in France, and at the beginning of last year its occurrence in the Mediterranean fever was described in our columns by Ellis. Another example has been lately published in *L'Union Médicale* by M. Sevestre, who has added some interesting comments on the complication. The patient had suffered from a severe attack of typhoid, of ordinary type, and was in full convalescence, free from fever, walking about the ward, when he suddenly experienced considerable pain about the groin, and it was found that the right side of the scrotum was reddened, and the testicle swollen and painful. The epididymis was not involved, but the spermatic cord was slightly painful. The left testicle was normal. There was no urethral discharge. The inflammation gradually subsided, and had disappeared at the end of six days. The affection usually comes on in the same sudden manner as in this patient. In most other cases the onset occurs during convalescence—three, six, ten, and even twenty days after the cessation of pyrexia. In no recorded cases had any complication accompanied or followed the fever to which the orchitis could be referred. The onset of the testicular inflammation is usually attended with a return of fever, and the temperature

may even rise to 103° or 104° F., the pulse to 120, and violent rigors may occur. In such a case, especially if the local pain is slight, the physician may think he has to do with a relapse of the typhoid, and in a case of unexplained pyrexia during convalescence from this disease the testicle should always be examined. In very rare cases the orchitis comes on before the primary fever is over. When the pain is slight it may only amount to a sense of uneasiness in the testicle, which is not always exaggerated by pressure. When severe it does not amount to a very intense degree, and is never neuralgic in character. The inflammation is always unilateral, and the epididymis is never involved. It appears to be more frequent on the right side than on the left (in seven out of nine observations). In the majority of cases (eight out of twelve) the affection is trifling; the inflammation does not go beyond the congestive stage, and it ends in from six to ten days. Occasionally even this degree is not attained, and transient hyperæmic swelling alone is noted. Sometimes its course is less benign; the local inflammation attains a considerable degree of intensity, and pus may be formed, and the suppuration may go on to complete destruction of the organ. Moreover, in the cases which run a mild course the affection may leave a persistent induration about the epididymis, and in one case atrophy of the testicle ensued. The pathology of this complication is still obscure. That it should recur especially in certain epidemics affords no explanation of its origin. Of the theories proposed, that it is a rheumatic inflammation, or one allied to the inflammations which follow scarlatina, or that it is due to a thrombosis in the spermatic vein, none appear satisfactory.—*Lancet*, Dec. 9, 1882.

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Acute Rheumatism.

Karl Vohsen (*Jahrb. f. Kind.*, xix. 1) in an interesting article discusses first the many theories as to the etiology of rheumatism, finds most of them untenable or unsupported by any definite facts, but leans rather to the belief that it is an *acute infectious disease*, due probably to micrococci in the blood. The many complications are discussed in relation to this point.

Childhood suffers from all the complications of acute rheumatism which befall adults. Paralysis of the muscles of the eye is the only one the author has not seen in children. But still rheumatism in children has its own characteristics. The severity and duration of the pain are less on the average than in adults, the duration in adults being two to three weeks, and in children five to eighteen days. The complications in children show still greater differences. Chorea, a frequent complication in early years, is exceedingly rare in adults. Heart affections are very much more frequent in children. From his own cases and the records of many others the author finds that the heart is affected in nearly fifty per cent. of cases in children. This complication is as apt to occur in mild cases as in severe ones; in fact, some authors think it more frequent in the subacute cases.

The author then analyzes twenty cases which had recently come under his notice. The ages were between nine and fourteen years No deductions as to hereditary influence or sex could be fairly drawn. In nine cases there was endo- or pericarditis. In none of these was the fever at any time above 103.2° F., and in one case there was no fever.

Swelling of the joints was observed in three cases. The pain was severe but of short duration. In all cases the salicylate of soda proved promptly effective against the affection of the joints, but had no effect on the development of the cardiac complications. These occurred in about half of all the cases. The mitral valves and the pericardium were most frequently attacked. The lighter

forms of rheumatism seemed especially to predispose to the heart troubles, making examination of the heart necessary in all cases.

As to why the heart is affected in children more often than in adults the author can offer no explanation. Anatomy and physiology give us no theories. The noduli, Jacobi's narrowness of the aorta, and other anatomical points of difference between the child's and the adult's heart have disappeared before the age at which rheumatism is frequent. The author then argues that the best theory to explain it is that rheumatism is an acute infectious disease, and attacks the heart of the child more often on account of the less power of resistance it has. Further, exactly this relation of the heart to acute rheumatism is an argument in favour of its infectious origin. Of forty-five cases of endocarditis in childhood reported by v. Dusch, fifteen were idiopathic, twenty were connected with acute, two with subacute rheumatism, and the remainder were complications of outspoken infectious diseases—scarlatina, variola, syphilis congenita. The acute rheumatism, therefore, so far as the heart complication is concerned, would seem to class itself with these acute diseases. Further, the rheumatism especially causes heart complications because its affection especially attacks synovial membranes, and because there is so marked a parallelism between synovial membranes and the endocardium. All the darkness which surrounds the development and course of acute rheumatism is not removed by the supposition of a specific virus, but the author claims that not only has the theory good facts for its support, but also it explains more of the symptoms and complications than any other theory which has been offered.—*Amer. Journ. of Obstet.*, March, 1883.

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Diabetes Insipidus of Nervous Origin.

An instance of the connection between diabetes insipidus and disturbance of the central nervous system, recently recorded by Flatten, is of much importance not only to the pathologist, but to the physiologist, as it confirms certain previous observations respecting the localization of the urinary centres or nervous tracts (*Archiv für Psychiatrie*, XIII. 3, S. 671). The case was of traumatic origin. A man, aged twenty-two, sustained a severe injury to the left side of the neck and the occipital region, with temporary loss of consciousness, variable diplopia, and impairment of hearing on the right side. Almost immediately after the accident, polydipsia and polyuria set in; and later on boils made their appearance. When seen by Flatten, the man was found to be suffering from complete paralysis of the left external rectus, and partial paralysis of the right external rectus. Hearing was lost at the external meatus of the left side, whilst sounds were conducted through the structures of the head. There was neither sugar nor albumen in the urine, which amounted to twelve litres (423 ounces) per diem. Iodide of potassium was exhibited internally, and mercurial ointment rubbed into the neck, whereupon the polyuria decidedly diminished. Flatten's diagnosis of the locality of the lesion was that it was situated close under the nucleus of the left sixth nerve, which it destroyed, whilst it extended across the middle line and affected the nucleus of the right sixth nerve; but confessedly this diagnosis did not account for the peculiar disturbance of hearing. It is a fact of the greatest possible interest that the present case is the third instance on record of the association of traumatic polyuria with paralysis of the sixth cranial nerve.—*Med. Times and Gaz.*, Feb. 10, 1883.

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Muscular Spasm at the Commencement of Voluntary Movements.

Under the above title, a very interesting and critical study is made of a disease hitherto undescribed in France, and almost, if not quite, unrecognized in

this country, by MM. Gilbert and Marie (*Archives de Neurologie*, vol. v., No. 13). The patient upon whom their observations were made was a native of Cairo, aged twenty-six, the essential feature of his disease being that whenever he put any group of muscles into action they became seized with tetanic rigidity, lasting two or three seconds, and passing off gradually, not to reappear whilst he kept on using the same set of muscles: thus, in going upstairs his legs became rigid at once; but after he had mounted a few steps the rigidity disappeared, and he was able to go up the rest like any ordinary person. His arms were affected in a similar manner, as also the muscles of his eyeballs, tongue, and larynx. The muscles of his face were not affected, and he had never had any trouble in deglutition, defecation or micturition. During the spasm the affected muscles were notably increased in resistance and stood out in relief. He was a well-nourished, muscular man. The muscles were not hypertrophied, but were unusually sensitive to pressure. Myoidema was obtained in the gastrocnemii, and to a less degree in the quadriceps. The tendon-reflexes were natural, and passive movements did not provoke rigidity. There was no lordosis. The chief fact brought out by the electrical examination was the readiness with which the contraction produced by the current became tetanic, and also the way in which spasm was developed in the muscles adjoining that acted upon. He seems to have been an intelligent man, though somewhat deficient in memory, and with a rather violent temper. There was nothing noteworthy in his family history. The muscular affection was believed to have commenced when he was about ten years old. Amongst the various cases of this disorder that the authors have succeeded in collating, the most interesting series is that published by Dr. Thomsen, who was himself the subject of the affection, and who had been enabled to trace it in his own family through three generations. The history of this family is so interesting that we need make no apology for giving it here. Dr. Thomsen's great-grandmother died of puerperal mania in her first confinement; her two sisters had some mental affection late in life; her son (the narrator's grandfather) also had some mental affection in old age, and he left four children, the two younger of whom had this muscular rigidity in a marked degree, and were also deficient in intellect. The two elder were healthy; one of these was the narrator's mother. Of her thirteen children, no less than seven were affected with this muscular rigidity. In the next generation it has shown itself in six out of thirty-six children (including Dr. Thomsen's own four, all of whom had it, one even showing it though it died in infancy). After such a history as this, the influence of heredity cannot be denied. In discussing the nature of this affection, the authors incline to the view that it is of muscular origin, notwithstanding the fact that two observers have failed to detect any morbid state of the muscular fibres. In conclusion, they point out the objections to one of the names that has been given to it, viz., "spasmodic hypertrophic spinal paralysis," inasmuch as there is no hypertrophy and no paralysis, and no evidence to support the idea that it is of spinal origin.—*Med. Times and Gaz.*, Feb. 24, 1883.

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Treatment of Epilepsy with Sodium Nitrite.

At the meeting of the Royal Medical and Chirurgical Society, held on Nov. 28th, Dr. Chas. H. Ralfe claimed the credit of first introducing this drug for the treatment of epilepsy for Dr. Law, of Hastings, who was the first to administer it, and who had fully described the theoretical reasons which led him to employ it, together with an account of its physiological action, in the *Practitioner* for June of the current year. Sodium nitrite in its action resembled nitrite of amyl and nitro-glycerine. It had one advantage over these remedies for the treat-

ment of epilepsy; its effects were produced more slowly, and were more permanent in character. The dose should just fall short of producing full physiological effect. The author advised that care should be taken to ascertain the purity of the drug, as many samples contained an admixture of sodium nitrate. The details of seventeen cases treated by the author in the out-patient department of the London Hospital were given. Of these seventeen cases, three received no benefit, four improved slightly, one was a doubtful case, whilst nine were benefited decidedly. Of all the cases, eight, previously to treatment with sodium nitrite, had been treated with bromide of potassium. Of these, three had improved under its use, and went back when the medicine was changed to sodium nitrite. Of the other five, the bromide treatment was inefficacious from the first in three cases; and in two, though it had done good for some time, it was losing its effect, and the patients were suffering from "bromism." In four of these cases, decided improvement followed the change to sodium nitrite, and the other improved to a lesser degree under its use. Nine of the patients commenced treatment directly with sodium nitrite. Of these, the disease in four was of long standing, and probably the patients had already been subjected to a course of bromide of potassium at other hospitals. Of these, two improved under sodium nitrite, and two received decided benefit. The remaining five cases were all tolerably recent ones. Of these, three received decided benefit, one slightly improved, and one was a doubtful case. Among the cases that received decided benefit, the longest exemption from any kind of epileptiform seizure, was one who went eleven weeks without an attack—four weeks whilst under treatment, and seven weeks after leaving off the medicine. Another patient went eight weeks without an attack, and had no relapse at the time he was last seen; he was still an out-patient, and taking the medicine. Previously to commencing treatment, he had on an average three fits a fortnight, and they were increasing. Another remained free for a period of four weeks, and had no recurrence when he gave up his out-patient letter. Another, who had a fit on an average every week, after taking the medicine was free for five weeks. The same result obtained with another, who was free for one month. The author drew the following conclusions from these results. 1. Those cases in which bromide of potassium is of marked service are not generally suitable for a trial of sodium nitrite. 2. Those cases in which bromide of potassium does not agree well from the first, will probably be found to improve under sodium nitrite. 3. To patients who have taken bromide some time, and in whom the drug is apparently losing its effect, or who are suffering from bromism, sodium nitrite is useful as a change of medicine. 4. There are a class of cases, consisting chiefly of minor seizures or convulsive attacks, such as often occur in young persons usually at night, in which sodium nitrite is especially beneficial.—*Brit. Med. Journal*, Dec. 2, 1882.

Nervous Derangement in Diabetes.

The subject of diabetic coma, and its supposed connection with lipæmia, fatty embolism, and acetonæmia, has been lately much discussed, while less attention has been given to many other signs of disturbance of the cerebro-spinal nervous system which are apt to occur in that disease. We do not intend in the present article to take up the subject of diabetic coma, further than to say that it is by no means proved, as some of the most recent writers on this subject seem inclined to assume, that the presence of acetone, or the superabundance of fat in the blood, is really the cause of that peculiar form of dyspnœic coma, which in a number of instances terminates the malady in such a striking manner; but the pathogeny of this peculiar condition will probably be found to be connected with the general

exsiccation of the tissues, and more especially of the nervous matter, which is found in diabetic subjects, and to which attention has been more particularly drawn by Ranke.

On the present occasion we intend to refer to some other forms of neurotic disturbance liable to crop up in the course of diabetes, and to which an able and laborious essay by Bernard and Féré in the *Archives de Nevrologie* for November, has been devoted. These symptoms occur in the sphere of motion, general and special sensibility, and the intellect, while trophic disturbances are on the whole rare; and they have all one feature in common, viz., that they appear most unexpectedly. They seem, on the whole, to depend less on the diabetes itself than on the general nutritive changes in the system which are determined by the glycosuria. Analogous symptoms are not unfrequently observed in patients who are subject to uric acid diathesis, which is so closely allied to diabetes; moreover, they appear often when the quantity of sugar in the urine has diminished, and diabetic patients are occasionally found to succumb to cerebral symptoms just at the moment when they are no longer glycosuric.

In the sphere of motility, the earliest, most frequent, and diagnostically speaking, the most important symptom is a sensation of fatigue, lassitude and utter want of muscular energy. This does not depend on muscular emaciation, which is one of the later symptoms of the malady; but comes on, without apparent cause, either in the lower extremities or the loins, and may be severe enough to raise suspicion of spinal disease. There is difficulty in walking, the movements are slow, awkward, and without vigour; and the degree of the trouble varies a good deal, according to treatment, diet, etc. This lack of power may occur quite suddenly after a slight injury, and it has been attributed to defective nutrition of the muscles by the saccharine blood.

Various forms of paralysis are also observed, which are either localized, partial, and incomplete, or there is regular hemiplegia. At first, there may be an attack of apoplexy, with consecutive hemiplegia, which may get well; and there may be a repetition of these symptoms later on. In other cases, the apoplexy proves fatal, or there is simple loss of consciousness without subsequent paralysis, or a bad attack of vertigo. Again, paralysis may come on without being preceded by apoplexy; and hemiplegia of one side may be combined with monoplegia of the other. Monoplegia is, indeed, so frequent in the course of diabetes, that it is always advisable to examine the urine for sugar in such cases. Palsies of this kind may be confined to a limb, or part of a limb; to a single muscle, or a small group of muscles in the face; and they affect frequently the tongue and the muscles moving the eyeball. They may be quite transitory, indeed, last for a few hours only, and are often incomplete.

Difficulty in speaking may be either of the aphasic or the anarthric kind, or be simply owing to general debility combined with dryness of the tongue. Sometimes, there is a more or less complete loss of the memory for words. A temporary kind of aphonia is probably owing to transitory paralysis of the muscles of the larynx. There are not as yet any very conclusive observations on palsies of the muscles of the eye, although Kiwatkowski has recorded a case of paralysis of the fourth nerve in a diabetic patient, and the rectus externus has been found paralyzed under similar conditions.

Another interesting symptom in the motor sphere is loss of the muscular sense, and a consequent tottering gait, especially in the dark. This may be combined with "pins and needles" in the lower extremities, and therefore simulate tabes spinalis or locomotor ataxy. Indeed, one cannot help being struck by the close similarity of many of these symptoms to those of tabes.

Cramps and convulsions are far from common. The former appear generally

at an early period of the malady, together with the muscular lassitude. Cramps occur mostly in the lower extremities, and at night, and thus lead to insomnia, in the same way as polydipsia, nocturnal urination, sensations of pricking, tingling, and cold. Sometimes, however, insomnia appears without any of these apparent causes, and should lead us to test the urine for sugar; it is then, indeed, the first sign of disturbed cerebral circulation, and may be the precursor of more serious troubles. Convulsions may be observed, either by themselves, or associated with diabetic coma, or with different kinds of palsies. In the latter case, they are most probably owing to cortical lesions, more especially because they sometimes show the characters of partial monoplegic epilepsy, and alternate with temporary paralysis seated in the same area of the brain. The vertigo which is sometimes observed is probably allied to these epileptiform phenomena.

An important feature of the pathogeny of these cases is, that such palsies may be developed some time before the diabetes appears, as seen by Dr. Pavy, or just when the sugar disappears from the urine, or after it has been completely absent from it for several months consecutively. All the symptoms hitherto mentioned are subject to frequent remissions, which has led some observers to consider them due to congestion; but they may also be explained by limited destruction of certain parts, which are afterwards supplemented by other similar parts. Dr. Dickinson has described lesions in the nervous system of diabetic patients which he looks upon as primary, and as explanatory of all localized morbid phenomena, viz., miliary excavations along the bloodvessels, containing extravasated blood, or crystals of hæmatine, and areas of miliary sclerosis in the brain, as well as in the cord. Subsequent observers have, however, not been able to corroborate these observations, and it seems exceedingly doubtful whether such lesions are really primarily developed.

With regard to sensibility, it is found that complete anæsthesia is rare; local areas of insensibility are, however, sometimes noted, so that hairs may be pulled out without causing any pain to the patient. More frequently there are complaints of tingling, tightness, cold, heat, and numbness, especially in one or both lower extremities, or in the sexual organs. Like the tabetic patient, the diabetic is exceedingly sensitive to external cold. Tactile sensibility may vanish, so that the patient is unable to hold a pin between his fingers without looking at it. Some patients lose the proper sensation of the ground on which they are walking. Pain in the joints, the loins, the haunches, and the back is common, and it seems particularly to invade the neck, where it is felt as a burn or the bite of a dog, and is combined with stiffness of the muscles. This rigidity extends occasionally from the back of the head down to the sacrum. There may also be headache, pressure on the top of the head, and various forms of neuralgia, more especially symmetrical and obstinate sciatica. Lightning-pains, similar to those of ataxy, have likewise been observed, and may, if combined with difficulty in standing, plantar anæsthesia, and areas of hyperæsthesia, lead a hasty observer to the diagnosis of tabes.

Sexual desire is generally in abeyance. In men there is frigidity and impotency, in women actual repugnance to connection. Certain neuroses, such as asthma, angina pectoris, and exophthalmic goître, may be combined with glycosuria. Deafness is more frequent in the diabetic than in other persons, and seems sometimes purely nervous, while in other cases it is owing to lesions of the middle ear. Anorexia and perversion of the sense of smell have also been observed.

It is, however, the ocular affections occurring in diabetes which are of the greatest importance for diagnosis and prognosis. A more exact knowledge of the lesions found in the retina of the diabetic will, probably, in time, lead us to a better comprehension of the cerebral symptoms occurring in the same disease.

Diabetic amblyopia may be slight or grave, and may be the first symptom of diabetes. All objects appear to the patient in a kind of yellowish haze, and this is worse after meals. In general, both eyes are unequally affected. In most cases this appears due to paresis of accommodation, and the ophthalmoscopic examination of the fundus of the eye shows this to be normal, or, at most, the presence of a slight congestion of the optic disc. Glycosuric retinitis occurs in severe cases, chiefly towards the end, and does not appear to differ materially either in objective or subjective symptoms from albuminuric retinitis. Further researches on the finer changes of the retina in diabetes are most desirable.

The intellect is generally below par, the memory impaired; there is much despondency and apathy, interrupted by terrifying dreams, hallucinations and delusions, which may lead to suicide. At other times the patient is simply passive, hates to be disturbed, and cares for nothing but to be left alone. This intellectual decay often coincides with gradually progressive physical debility; but general paralysis of the insane and other similar affections, which have been occasionally observed towards the end, seem to be mere coincidences.

Trophic disturbances, such as are common in certain diseases of the spinal cord, may occasionally be observed in diabetic patients, such as perforating ulcer, with formation of eschars and copious hemorrhage, localized sweating, atrophy of the skin and adjacent tissues, and muscular atrophy.—*Brit. Med. Journ.*, Dec. 9, 1882.

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The Communication of Tubercle by Inoculation and the Pathological Nature of the Lesions resulting therefrom.

Prof. Burdon Sanderson has been making a long series of investigations, from which he draws the following conclusions:—

1. The characteristic product of tuberculosis is not an aggregation of shrivelled particles of irregular form, but a tissue composed of lymph corpuscles held together by a network of hyaline connective substance.

2. There is a close structural analogy between this tissue and that of certain follicular organs belonging to the lymphatic system, *e. g.*, the follicles of Peyer, the ampullæ of the lymphatic glands, etc.

3. All the favourite seats of tubercle are naturally characterized by the presence of this tissue, which, from the analogy stated above, may properly be called *adenoid*.

4. The natural distribution of adenoid tissue in the body is an intimate relation with the lymphatic system. In the great serous membranes (which v. Recklinghausen's discoveries have taught us to regard as walls of lymphatic reservoirs) it forms sheaths round the bloodvessels, or masses of microscopical dimensions and irregular contour underneath the epithelium. In the solid viscera it is distributed here and there in the course of the lymphatic channels.

5. In the peritoneum, tuberculosis primarily consists in the enlargement or overgrowth of these sheaths or microscopical masses of adenoid tissue, and consequently the tuberculous nodules which are formed have the same intimate structure, and stand in the same anatomical relation to the vessels and epithelium. In the viscera the essential lesions also consist, not in new growth, but in overgrowth of pre-existing masses of adenoid tissue.

6. The primary local lesion in artificial tuberculosis, whether the cause be simple wound or specific inoculation, consists in the development at the seat of injury of granulations or nodules which have similar structural characters with those of adenoid tissue elsewhere, but cannot as yet be shown to be in relation with the absorbent vessels.

7. The first step in the dissemination of tubercle consists in its being absorbed

primarily by the lymphatics (which convey it to the lymphatic glands of which they are tributaries), and secondarily by the veins. Having thus entered the systemic circulation, it is distributed universally by the arteries. The serous membranes seem, however, by preference to appropriate it, and from them it extends by contiguity to the superficial parts of the organs which they cover.

8. The final stage of the process consists in the tertiary infection of the glands of each diseased organ, which glands consequently undergo enlargement and induration, and eventually become partially caseous. The enlargement is due to the multiplication of cells in all the tissues of the organ, but more particularly in the alveoli—the hardening to a process of fibrous degeneration—while the caseation consists in slow necrosis of the previously hardened and anæmic parts. From the first the gland is incapable of performing its functions, but it is not until induration commences that the absorbents of the organ to which it belongs are completely obstructed.

9. In the liver of the guinea-pig, and in some other organs, tuberculous tissue undergoes a fibroid degeneration and caseation, the results of which cannot be distinguished from those observed in the normal adenoid tissue of the lymphatic glands and of the spleen.

10. As regards the question of a *specific contagium* of tubercle, we think it very important to note that this is not yet disproved by the facts of traumatic tuberculosis. It still remains open to inquiry whether or not injuries which are of such a nature that air is completely excluded from contact with the injured part are capable of originating a tuberculous process.—*Practitioner*, Dec. 1882.

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Paracentesis and Incision of the Pericardium.

Dr. A. PARTZEVSKY (*Mediz. Obozr.*, March, 1882) brought before the Moscow Physico-Medical Society a very interesting case of pericardial effusion, treated by repeatedly performed tapping, and finally by incision of the pericardial sac with subsequent drainage. The author at some length discusses the subject of operative treatment of pericardial effusions, and sums up his own views thus: 1. In a vast majority of cases the operation (that is, puncture and aspiration, and, if they fail, subsequent incision with drainage) is not attended with any danger. 2. It brings rapid relief, and its palliative usefulness is not denied even by the opponents of operative interference in similar cases. 3. In the absence of such complications as tuberculosis, cancer, organic changes of the heart, etc., the operative treatment of non-purulent pericardial effusions may prove successful in the majority of cases. 4. In cases of purulent pericarditis, it is perfectly justifiable to try an early operation, in order to prevent dilatation and fatty degeneration of the heart, which generally supervene here very rapidly.—*London Medical Record*, Feb. 15, 1883.

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Intestinal Polypi.

At the meeting of the Pathological Society of London, held December 19, 1882, Mr. BOWLBY brought forward three cases illustrating the varieties of intestinal polypi: 1. In a man, aged sixty-four, who had had no intestinal symptoms, there were found diffuse polypoid growths throughout the colon, commencing just above the ileo-cæcal valve, and extending down to the sigmoid flexure. They were found in the mucous and sub-mucous tissues, and some were pedunculated. It was noteworthy that there was no stricture of the intestine. 2. A polypus removed from the rectum of a girl aged twenty-four, who had had no intestinal symptoms beyond slight constipation. The polypus was attached to the anterior wall of the rectum, about four inches from the anus; it was soft and suc-

culent, and covered everywhere by mucous membrane. It was accidentally ruptured during removal, and some turbid fluid escaped. After removal it weighed two pounds all but an ounce. Its chief interest lay in its size. 3. A polypus of the small intestine occurring in a female child, aged five. He gave the following history of the case: She was seized with pain in the abdomen suddenly one day; next day she passed some blood by the bowels, and during the next few days slime. She was admitted into St. Bartholomew's Hospital, ten days after the commencement of her illness, with a mass protruding from the anus, which eventually came away, and a portion of which was recognized to be the vermiform appendix. After this the child went on well, and left the hospital apparently recovered. Some months later she was brought back with symptoms of congenital syphilis, was readmitted, and died not long afterwards. At the autopsy the cause of death was recognized to be recent peritonitis. On opening the intestine, a polypus of fibrous tissue was found about eight inches from the anus, but evidently in the small intestine, and three inches and a half below this there was a transverse scar completely encircling the gut, where the small intestine, at what might have been the ileo-cæcal valve, had become adherent to the rectum or sigmoid flexure, so that the whole of the colon and cæcum had disappeared by sloughing. There was very slight constriction at the site of the scar. Mr. Bowlby remarked that when a polypus set up intussusception it was usually the part to first present at the anus and be expelled. In this case it must be assumed that the polypus had set up increased peristaltic action of the intestines below it, and had never been actually involved in the invagination itself.—*Med. Times and Gaz.*, Dec. 30, 1882.

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Peri-Splenic Abscesses.

In an article on purulent peri-splenic collections, C. Zuber reports (*Rev. de Médecine*, Nov. 1882) two interesting cases in which such purulent collections were found after death, the true character of which had not been suspected during life. In one of the cases the post-mortem revelation was a complete surprise, because no symptoms had been observed calling attention to the left side; and in the other there was an error of diagnosis, as the case had been considered as one of intro-abdominal malignant disease. The notes of these cases are given at length; both had a history of repeated malarial attacks. Following these is a brief consideration of other cases contained in medical literature of this very rare form of disease. The more important points of this essay may be summed up as follows: (1) In the upper portion of the abdomen are found purulent collections, which are called peri-splenic abscesses, although they only touch the spleen at one part of its surface, and are not at all localized in the sub-serous connective tissue of the spleen. They occupy by preference the irregular space bounded by the stomach, the spleen, the colon, and the diaphragm. These collections are the last stage of circumscribed peritonitis, due ordinarily to lesions of the spleen or the digestive tube. The infectious form of splenitis (comprising herein the lesions of malaria), and the round ulcer of the stomach, appear to play the principal rôle in these intra-abdominal abscesses. (2) The purulent collections of digestive origin contain gas, and their character is shown, with remarkable uniformity, by a resemblance more or less complete with pyo-pneumothorax, the more so because they are only separated from the pleura by the diaphragm, which is strongly pushed upward. The nature of these cases of false pyo-pneumothorax will be recognized at first by the existence of grave digestive disorders, and subsequently by the variability, the exaggeration or insufficiency, of the symptoms observed. The collections of splenic origin are scarcely ever

characterized by tumefaction and pain of the hepatic region and the general signs of latent suppuration; rarely, by tumours more or less marked or fluctuating. The diagnosis will scarcely be made except by exclusion. (3) Whatever may be the origin, the depth, or the extent of these peri-splenic collections, they are not above the resources of modern surgery. It is this practical point of view which will dominate the question. No effort should be spared in order to determine the existence, and then the nature, of the abscess; and exploratory punctures, either deep or multiple, should not be too much feared. Made methodically and prudently, such explorations bring only an insignificant danger, as the recent literature of hepatic abscess abundantly shows; they alone may be, on the contrary, the point of departure of a truly rational and useful therapeutic method.—*Practitioner*, February, 1883.

SURGERY.

Neurectomy of Inferior Dental.

Dr. SONNENBERG, of Berlin, has instituted a new operation for the excision of a portion of the inferior dental nerve, which he describes in the *Berliner Klinische Wochenschrift* for October 16th. It will be remembered that the nerve in question enters its bony canal on the inner surface of the ramus of the lower jaw, under cover of the internal lateral ligament. Dr. Sonnenberg found in the dead subject that, having the head held strongly backwards, it was possible to reach the inferior dental nerve by a neat incision, which was begun one centimetre and a half in front of the angle of the jaw, and continued along the (in this position) ascending border of the body of the lower jaw for three to four centimetres, as far as the facial artery—an incision which corresponds roughly to the insertion of the masseter muscle. We may say that two centimetres and a half is an inch, as nearly as may be. This being done, the inner surface of the lower jaw-bone must next be cleaned up to the internal lateral ligament, which usually lies about two centimetres and a half from the angle of the jaw; the insertion of the internal pterygoideus must be separated from the bone; the ligament and nerve may now be felt, and with good light the latter can be seen in the bottom of the crateriform wound. Next a strong blunt-pointed hook must be conducted by the finger up to the ligament, and then somewhat upwards along the ascending ramus of the jaw, and at the same time inwards in the direction of the buccal mucous membrane. In this fashion the nerve is hooked up without touching the neighbouring artery, which lies very close to the bone. The lingual nerve is quite to the inner side, and is not meddled with. The inferior dental so secured is very extensible, and can be drawn down towards the angle of the jaw, and a portion easily cut therefrom. The other methods (done either from the mouth, or by trepanning the lower jaw from the outside) are nothing like so good as this new operation, according to the author.

The advantages are enumerated: (1) The wound is the smallest possible; (2) the operation is done comfortably, provided the formal retraction of the head is thoroughly observed; (3) the bleeding is insignificant; (4) the capsule of the submaxillary gland is left intact, and so no burrowing of pus can take place there; (5) the nerve is easily found and brought forward alone; (6) a good piece can be excised, because the nerve can be drawn out so easily; (7) the wound is favourably situate for healing; (8) the scar is small, and in an unobjectionable place.

Dr. Sonnenberg has operated on the living subject three times for neuralgia, with eminent success both as regards operation and relief from pain. Von Langenbeck has used this method of operating once; but the nerve was only strongly stretched, not excised. The relief from neuralgia seems to have been equally great.—*Med. Times and Gazette*, Dec. 9, 1882.

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Complete Luxation of the entire Arytenoid Cartilage.

CHVOSTEK reports a case of typhus in which the fever took on a pyæmic character. The patient was awakened suddenly in the night by extreme dyspnœa, and soon became unconscious. The respirations were very deep, and occurred every ten or fifteen seconds, and inspiration was accompanied by a harsh laryngeal sound, while the larynx descended low in the neck, and there was great depression of the epigastrium, intercostal spaces, and supra-clavicular fossæ at each inspiration. Expiration was nearly normal and noiseless, swallowing was impossible, the pharynx insensible, and reflex absent. Tracheotomy was at once performed, but failed to save the patient.

At the autopsy, the entire left arytenoid cartilage was found lying nearly loose in the rhima glottidis, only being bound by a slender thread of tissue to its former seat. The posterior half of the true and false vocal cords on the left side were also implicated by ulceration in the displacement. There was œdema of the right ary-epiglottic fold.—*Centrlb. f. d. Med. Wissen.*, Dec. 30, 1882.

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Sarcoma of the Tonsil Cured by Iodoform Injections.

At a recent meeting of the Imperial Society of Physicians, in Vienna, Prof. WEINLECHNER presented a patient who had been cured of a sarcoma of the tonsil, with contemporaneous glandular enlargement in the neck, by iodoform injections at the hands of Dr. Schum. There were present Professors Billroth and Albert, both of whom had seen the patient and declined to operate upon him. The history of the patient was as follows: He first noticed his disease in March, 1881, and consulted Billroth, who pronounced the case hopeless and unfit for operation. He then went to Albert, who at first agreed to operate, but after a more careful examination refused. In June he went to Weinlechner, who found in the region of the left tonsil a tumour about the size of a lemon, much fissured and ulcerated, and a glandular swelling as large as an orange, deep in the neck, below the angle of the left jaw. Weinlechner agreed to operate, stating that it would be necessary to resect the jaw also, that even then he could not guarantee a radical extirpation, and that a speedy recurrence was not improbable. This outlook deterred the patient from submitting to an operation. Weinlechner then advised him to submit to iodoform injections (1 part to 10 of ether) by Dr. Schum.

Sixteen injections were made in the inner tumour and fourteen in the neck, each consisting of 2½ to 3 drops. In the beginning of August, after the sixth injection in each place, the glandular swelling was almost gone, and the tonsillar tumour decidedly smaller. In anticipation of a favourable and therefore interesting issue, the tumour was examined by Prof. Chiari, and pronounced a spindle-celled sarcoma. Now, however, occurred an unpleasant interruption. In the beginning of December the remains of the tumour in the fauces emitted an offensive odour, and in the night of December 14th four hemorrhages took place. As the hemorrhages amounted to about half a litre (a pint), Weinlechner, aided by Schum, ligatured the left common carotid artery. Silk was used for the ligature, and the ends were cut off short. A fistulous track remained, from which two months later a hemorrhage occurred, which was checked with tampons of styptic

cotton. The fistula remained open, in all, six months. During this time the patient had severe gastric catarrh—perhaps caused by absorption of iodoform—and a bronchial catarrh, and presented so melancholy a spectacle that metastasis was suspected. The use of iodoform was now discontinued, and the patient's appetite increased and his appearance improved. Under the diligent use of gargles of permanganate and chlorate of potash, the tumour in the fauces steadily diminished, and in its place there could be felt a comb-like elevation on the left wall of the fauces, extending downwards to the space between the pharynx and the tongue. This ridge-like elevation had disappeared in August, 1882, and now nothing can be felt of the tonsillar or glandular tumour, and only a delicate scar in the tonsillar region and on the palato-glossal arch indicates the former position of the new formation.—*Allgem. Weiner Med. Zeitung*, Oct. 24, 1882, p. 466.

This is a most remarkable case, and hard to be believed. Yet that the tumour was actually a sarcoma can hardly be doubted in view of the opinion of so many distinguished surgeons, and the examination by Prof. Chiari. But, admitting this much, the query arises, how much good was done by the iodoform beyond causing a large slough? and what part of the cure ought to be attributed to the ligature of the carotid artery?

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Successful Resection of the Pylorus for Gastric Ulcer.

Dr. L. TH. VAN KLEEF, of Maastricht, has recently performed, with entirely successful results, the first case of resection of the pylorus done in Holland. The case was one of an unmarried woman, 37 years of age, who had for fifteen years suffered from a disease of the stomach, which for the last five years had been recognized as a gastric ulcer. The operation of resection was performed under strict antiseptic precautions. The abdomen was opened by an oblique incision, starting about three centimetres to the right of the linea alba, and three fingers' breadth above the navel, and extending to about six centimetres to the left of the linea alba. The greater and lesser omenta were ligated and divided, and the pylorus and duodenum drawn out of the wound, and the peritoneal cavity protected from entrance of foreign matter by a compress of antiseptic gauze. Rydygier's compresses were applied to the stomach and duodenum. The stomach was divided with the scissors between the clamps and the pylorus, and its mucous membrane divided so near the pyloric contraction that the opening into the cavity of the stomach was so small that only one finger could be inserted; this opening was subsequently sufficiently enlarged to make it fit the opening into the duodenum. The stomach and duodenum were united by five deep and five superficial Lembert's stitches, while the posterior edges were united by Wölfler's sutures, and the anterior by means of Czerny's sutures. The abdominal wound was closed and covered with a Lister's dressing. The excised portion measured four and a half by five centimetres, and was so contracted that a quill could be barely passed. On one side was situated an ulcer one centimetre in diameter and one millimetre in depth; no trace of carcinoma could be detected. The patient received a number of subcutaneous injections of ether, and for the first two days enemata of wine and milk and swallowed pieces of ice; there was no fever observed at any time, or any trace of peritonitis; on the third day she swallowed small quantities of fluid food; in six days the abdominal wound was completely healed, and in ten days she ate a beef-steak. In four months after the operation she had gained twenty-four pounds in weight.—*Deutsch. Med. Woch.*, Dec. 23, 1882

Volvulus of the Ileum treated by Abdominal Section.

At the meeting of the Medical Society of London, Dr. J. K. Fowler read the notes of a case of intestinal obstruction in which abdominal section was performed by Mr. Hulke, and volvulus of the ileum found and untwisted. The patient was much relieved by the operation, and the bowels were opened freely three times subsequently. Death took place three days afterwards from cardiac failure and hypostatic pneumonia. At the post-mortem examination a portion of the ileum with a long mesentery was found somewhat congested, the peritoneum generally was normal and the wound healthy.

Special stress was laid upon the advisability of operating early in cases of internal strangulation of the small intestine, and attention was directed to the following mode of proceeding, at the author's suggestion, after the abdomen had been opened. The finger was passed deeply down into the pelvis, where a portion of collapsed small intestine was found; this was withdrawn and carefully followed until the obstruction was reached. It was laid down as an absolute rule that in the operation of laparotomy the distended bowel should only be manipulated in case the surgeon after a careful search had failed to find the collapsed intestine.

The following advantages were claimed for this method of operation: (1) That the collapsed bowel can be examined with far greater ease and in much less time than an equal length of distended intestine; (2) that a considerable length may, if necessary, be exposed at one time, without any difficulty arising, when it is desired to return it into the abdomen; (3) that the collapsed intestine never leads to the duodenum—a matter of some importance; (4) that the danger from peritonitis from exposure of contracted bowel is very slight; and (5) that rupture during its manipulation is practically impossible.

It was suggested for the following reasons that in all cases of obstruction of the small intestine the contracted portion would be found, as in this case, lying in the pelvis: (1) The tympanitic abdomen shows that distended bowel is on the surface, as would be expected from its diminished specific weight; (2) that in making autopsies the author had noticed that if the upper portion of the small intestine be distended, the contracted lower end is always seen lying behind the distended portion, low down in the pelvis. The explanation offered was that during the violent and continued peristalsis, and gradual distension of the bowel above the obstruction, the smaller and less active portion of bowel below is forced into the pelvis, which is, besides, too small to hold a distended loop. Two cases were mentioned which had lately been operated on at the Middlesex Hospital, in which at the autopsy a second band had been found close to one divided during the operation; the result had not in either case been influenced by these bands having escaped notice.—*Lancet*, Feb. 3, 1883.

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Extirpation of a Displaced Kidney.

On Nov. 3d last Dr. William M. Polk extirpated the kidney of an unmarried woman, aged 19, who sought relief from severe pain and distress in the left iliac fossa. Examination showed the absence of the vagina, and neither uterus nor ovaries were to be found in the true pelvis. In the left iliac region, deep in the fossa, was a tumour, freely movable in all directions. It could be pushed as low as Poupart's ligament, as far outward as the anterior superior spine of the ilium, far enough inward to bring its inner border to the centre of the pelvic inlet, and far enough upward to bring its upper border a finger's breadth above the posterior border of the crest of the ilium. It was of oval form, its greatest

length being from above downward and inward, its lower extremity apparently smaller than the upper. Running from this lower extremity downward into the pelvis, apparently toward the posterior surface of the bladder, was a thin cord-like strip of tissue. This tumour coincided with the region of pain.

Carefully weighing all the reasons for and against, it seemed plain that he had to deal with a displaced kidney, but one that was intimately associated with menstruation—so intimately as to make it probable that there was a close relation between the organ and the ovary. The fact that all the menstrual symptoms pointed to the left iliac region and none to the right, that no enlargement or tenderness during menstruation could be detected in the right iliac region, suggested the idea that all the organs appertaining to that function present in the case were in the left side. The line of thickened tissue that seemed to extend from the inner edge of the tumour down into the pelvis between the rectum and bladder, together with the extreme nature of the symptoms, gave weight to this view. This point being decided, the next question was as to the measure of relief proper in the case.

It was evident that it was not a dislocated kidney, but one congenitally displaced, for it could not be pushed from the iliac fossa. No apparatus nor operation looking to fixing the kidney in the lumbar region could therefore be entertained. In fact, the element of mobility held but a subordinate position in the matter of distress.

The question was thus narrowed to removal on the one hand, or bearing with the suffering on the other.

In view of the dangers of removal, the patient, at our suggestion, concluded to endure her distress as best she could, and left the hospital.

In a few days she returned, and said she had tried to work, but could not, and that, after consulting with her friends, she had concluded to submit to the operation.

Several cases had been reported in which, death occurring after extirpation, it was found that the remaining kidney was so far diseased as to be useless. There seemed no chance of this mishap here, as there was not, nor had there been at any time, evidence of kidney disease. During the menstrual disturbance there had been traces of albumen in the urine, but never casts nor renal epithelium, and in the intervals the urine was characteristically healthy. The final question was as to the absence of a kidney.

In view of the genital malformation, there was a possibility of but one kidney being present, but how to determine this was by no means easy.

The patient was placed in the knee-chest position, and careful percussion of the renal regions was made, the result being that there was dulness on the right side, and deep tympanitic resonance on the left; the bimanual palpation of the lumbo-abdominal regions, owing to the tension and thickness of the abdominal walls, was negative. The method of Simon was now open (catheterization of the ureters), but the fact that, in common with many others here, he had tried this method several times, and had never succeeded (save when a large vesico-vaginal fistula existed), made him feel the attempt would be futile.

The method of examining the renal region by means of the hand in the rectum was discarded, for the reason that the pelvis was too small to permit of it without serious risk to the patient; it had been attempted while trying to determine the position of the uterus and ovaries.

The remaining method was the examination of the kidneys *in situ* after opening the abdominal cavity.

In planning the operation, his intention was to open the abdominal cavity in the median line as in ovariotomy, but, just before the day appointed, he saw a

case of extirpation of the kidney in consultation, in which, after the operation, owing apparently to the action of the ligatures, dangerous obstruction of the bowels had supervened. This caused him to reconsider his operation. Referring now to the position of the tumour in his case, it will be remembered that it was situated in the iliac fossa, and that it could be easily pushed down as low as Poupart's ligament; it was evidently closely attached to the fossa, as was shown by the fact that with the patient in the knee-chest position it did not fall forward toward the abdominal wall; it was probably behind the peritoneum under the sigmoid flexure. Evidently it could be removed by an incision just above Poupart's ligament. If its position was as he supposed, he should not have to open the peritoneal cavity. He could secure free drainage from the end of the ureter and the vessels, along a short tract downward, with no possibility of coming in conflict with an important organ. These considerations prevailed, and he decided in favour of the incision just above Poupart's ligament.

The patient being etherized, an incision was made parallel to Poupart's ligament, about an inch from it; its upper limit was on a level with the anterior superior spinous process of the ilium, its lower just outside the internal inguinal ring. The subperitoneal space in the iliac fossa was speedily reached. Pressure from above brought the kidney into the opening; an incision was made into a dense layer of connective tissue surrounding it, and at once the organ came into view. It was easily enucleated, and removed. Two ligatures were used, one for the ureter and one for the artery and vein. No blood was lost. It was evident that he had not entered the peritoneal cavity; but, before he could close the wound, the patient showed signs of heart-failure. This, however, passed off under stimulation. The wound was closed to within half an inch of the lower angle, through which the ligature of the pedicle was brought out, and a piece of doubled drainage tube introduced. The principles of Listerism were carried out during the entire operation. It lasted twenty-five minutes. Death occurred under symptoms of uræmic poisoning eleven days afterwards.

On post-mortem examination both kidneys were found to be absent. There was no trace whatever either of the right kidney or of the right ureter. The left kidney was removed during life. It did not occupy its normal position, but lay in a space in front of the iliacus muscle behind and to the side of the peritoneum. This space which contained the kidney extends from a little above the crest of the ilium to the brim of the true pelvis. The vagina and uterus were absent. Two large and healthy ovaries were present in normal situation.

The kidney removed, with the exception of increase in size, appeared to be normal.

Dr. Polk offers the following suggestion as to a method of procedure for establishing the presence of two kidneys: Take a large catheter, made of some substance like block tin, bend it to the shape of a Sims's sigmoid catheter; let the curve that passes into the bladder be as decided as it can be made, and yet not so great as to interfere with the ready passage of the instrument into the bladder. Suppose it to be the right ureter you desire to close. Introduce the instrument; then place the patient in the lithotomy position. Now carry two fingers as far into the rectum as possible.[1] Now place the catheter so that its curve in the bladder hugs the right pelvic wall; the end of the curve will pass directly across the line of the right ureter. Now press the fingers against the catheter, and the ureter will be sufficiently occluded to prevent all escape of urine. By means of the catheter in position (it may be double), the bladder can be thoroughly cleansed

[1] An instrument curved and grooved to receive the catheter might be substituted for the fingers for counter-pressure.

and emptied. As fresh urine flows in from the other ureter, it can be withdrawn and tested. As urine from a sound kidney is secreted at about the rate of a minim in four or five seconds, it will not require long-continued pressure to secure the amount of urine necessary for satisfactory examination. In the female the procedure is more certain of accomplishment than in the male, because we can, in a measure, fix the base of the bladder by traction upon the anterior vaginal wall by means of a tenaculum hooked into it just below the cervix, or, better, well to the right of the cervix, on the lateral wall, the traction being downward and to the patient's left.

The fact that a patient can live, and be in fair condition, eleven days without any kidney tissue, in Dr. Polk's opinion, would seem to prove that, if we can demonstrate the presence of a sound kidney, the removal of its diseased fellow (the disease reacting unfavourably on health and life) is not only permissible, but imperative.—*N. Y. Med. Journ.*, Feb. 17, 1883.

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Fixation of Wandering Kidney.

Dr. ROBERT F. WEIR reports (*New York Medical Journal*, Feb. 17, 1883) a case of wandering kidney in a woman aged 33 years, in which, under antiseptic precautions, he cut along the border of the quadratus lumborum muscle, not going too close to the twelfth rib, to avoid the pleura, as Holl directs, and divided all the tissues down to the mass of fat which surrounds the kidney, and then stitched this to the edges of the wound, and so secured the kidney in a permanent position. He then left the wound open and let it fill up with granulations, and finally cicatricial tissue formed in sufficient quantities to close the opening and support the kidney. The patient did well, and is now in a much improved condition.

E. BASSINI reports (*Annali Univ. di Méd. e Chir.*, Sept. 1882) the case of a woman aged 27 years, in whom, without any history of injury, the right kidney had become displaced. The organ was easily reached by a lumbar incision when pressure was made in the abdominal surface and stitched by four catgut sutures to the edges of the wound. A complete cure, with entire removal of all symptoms, occurred within twenty days.—*Centrlb. f. Chirg.*, Jan. 27, 1883.

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Nephrectomy for Chronic Pyelitis with Large Phosphatic Renal Calculus.

Dr. J. WILLISTON WRIGHT reports (*New York Med. Journal*, Feb. 17, 1883) the case of a woman, aged 34, who had suffered from constant dull pain in the right lumbar region for nine years. Upon examination a tumour was recognized by the touch in the right loin. It was as large as the fist, very hard, quite movable, and very sensible to pressure. At about the centre of its inner margin there was felt a nodulated mass, about the size of an English walnut, which was much harder than the remainder of the tumour, and which was much more sensitive, the patient complaining of nausea and great pain when it was handled, and especially when it was compressed between the fingers.

Believing the tumour to be the displaced kidney, and the nodulated mass a stone in its pelvis, Dr. Wright made use of the aspirator needle, passing it through the tumour both from the lumbar region and from the loin in various directions, but without being able to encounter the calculus, probably from his great care in avoiding the large vessels in its neighbourhood, as at the former attempt.

He now advised the removal of the whole kidney.

On October 14th, 1882, Dr. Wright extirpated the right kidney through an incision six inches in length, made along the border of the rectus muscle on the

right side. Afterwards the left kidney and other important organs of the abdominal cavity were examined and found to be normal.

The patient did fairly well for a week, when symptoms of obstruction set in due to the formation of an abscess in the site of the wound, which was cut into, and over the stump of the renal vessels a fluctuating tumour of the size of a hen's egg was found and opened, and from it about three ounces of very fetid pus were discharged. As soon as the abscess was emptied, the ascending colon, which had evidently been obstructed at that point, as well as the other divisions of the large intestine, began a series of writhing movements, which could be seen plainly through the abdominal walls, accompanied by loud gurgling sounds, as of gas rapidly changing its locality. A considerable quantity of gas now discharged from the anus. Within twenty minutes the patient ceased vomiting, and said she felt much better. The abscess cavity was washed out with a weak solution of carbolic acid, a drainage tube introduced, a hypodermic injection of morphine administered, and the patient left to rest.

On January 13th it is noted that the patient is feeble, owing chiefly to prolonged suppuration from the cavity of the abscess, which still continues to drain itself into the bladder. She passes an average of about thirty ounces of urine a day, which, aside from the pus it contains, is of a normal quality. She sits up for a short time each day, has a good appetite, good digestion, and is now evidently improving. Indeed, so far as the operation and the ability of her remaining kidney to do the work of excretion are concerned, he thinks he may safely say that the patient has recovered.

In commenting upon his case Dr. Wright says that upon the proper management of the bloodvessels of the kidney and ureter will often depend the success or failure of the operation, so far as the life of the patient is concerned, there can be no room for doubt.

Judging from his experience with a single case, if he was to do the operation again he would endeavour to isolate the four diverging branches of the renal artery, as well as the renal vein, from the mass of fat and connective tissue surrounding them, and ligate each one separately, even at the expense of a little longer exposure of the peritoneum, rather than to tie them *en masse*, as was done in the present case; moreover he would cut the ligatures short and leave them to take care of themselves, in the hope that they would either become absorbed or encysted, rather than to lead them out through the wound, thereby encouraging the formation of a suppurative tract.

To a neglect of these precautions he attributes the occurrence of the abscess which delayed the recovery of his patient during the past three months.

With regard to the ureter, he believes that whenever pyelitis is present, and especially whenever a calculus exists, either in the sinus or in the pelvis, this tube is necessarily diseased, and that an attempt should always be made, therefore, to remove as much of it as possible by ligating its vesical extremity and bringing the remainder of it out through the lowest part of the wound, as recommended by Mr. Thornton; another argument, by the way, in favour of laparotomy over the lumbar incision.

Had this been done in the present case, he has no doubt that his patient would have been spared the annoyance of having an abdominal abscess drain itself into her bladder, although, under the circumstances, it could hardly have selected a safer place, aside from the external wound.

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Extirpation of the Kidney.

Dr. Bruntzel, of Breslau, has successfully removed the left kidney with a colossal fibroma of its capsule. The fact is worth recording as another triumph

of abdominal surgery, for the growth weighed thirty-seven pounds and a quarter.

The patient was a female, thirty-three years of age. The tumour was first noticed five years before, and had gradually increased in size; it was painless. When seen by Spiegelberg and Bruntzel in 1879, it was thought to be probably connected with the uterus; menstruation was natural, and had been so since the age of fourteen. An exploratory puncture revealed nothing. In June, 1882, there was much emaciation, but no genuine cachexia; the swelling reached from the ensiform cartilage to the pubic symphysis, and distended the abdomen uniformly in all directions; there were no physical signs of disease in any other organ. Abdominal section was performed in July, with strict antiseptic precautions; the incision extended from the xiphoid process to the symphysis pubis. The tumour was found to be retroperitoneal in situation. The descending colon was felt in front of it at a hand's breadth from the mesial line. Punctures were made into the fluctuating growth without success; but by perseverance the enormous tumour and kidney were got out; the vascular pedicle was secured, the wound closed and drained in the manner of an ovariotomy; and compression and orthodox Listerism were adopted as dressings. There were marked signs of collapse on the removal of the fibroma, which were combated by hypodermic injections of ether and the performance of artificial respiration. The tumour was found to be a gigantic fibroma, which had originated in the left renal capsule, and was composed of a number of lobes, of sizes varying from a child's to a man's head. In this dense fibrous structure there were some areas of a loose, fatty nature, and in the centre was a reddish-yellow area of softening, with a thrombosed vessel in its neighbourhood. The left kidney was seated in a hilus, and its structure was quite normal. The sensation of fluctuation that had been felt was probably due to the presence of the intermingled fat. The operation lasted two hours and a half.

After the operation the pulse was very frequent, the temperature varied a little, the belly remained quite flaccid, and the discharge sweet. Vomiting never occurred, but some discomfort was felt from the loaded state of the tongue and mouth. The quantity of urine was very small for the first six days, but after that it attained to the normal, and so remained. A loose stool was passed on the eighth day. The superficial sutures were removed on the seventh day. The drainage-tube was done away with on the ninth day. On the tenth day something sudden happened, for the temperature rose, and the patient became unconscious and collapsed. This accident was attributed with justice to the descending colon having been ulcerated through, and the escape of a little feces from the small sinus yet remaining. The fistula healed, after being cauterized, in the beginning of August. A fresh escape of feces began at the end of the same month, and, although very small in amount, lasted. Another accident of a very interesting nature happened immediately after the operation, namely, paralysis of both *upper* extremities. Bruntzel speculates on this being of a reflex mechanism. It lasted in the right hand almost six weeks, and longer in the left. For treatment faradization was used. We should like to know more of the distribution and electrical reaction of this paralysis. Notwithstanding these unfortunate occurrences, the patient did so well as to get up at the fourth week, and her weight was seventy-five pounds (just as much again as the tumour weighed). Further improvement of the general health took place, but menstruation had not returned.—*Med. Times and Gazette*, Dec. 16, 1882.

New Mode of Affording Permanent Relief to Intractable Chronic Cystitis and Confirmed Prostatic Retention of Urine.

Sir Henry Thompson, F.R.C.S., believes that if it were possible to suspend all action on the part of the bladder, in such cases, for a few days only, to prevent any accumulation of urine within the organ, to allay the constant and painful want to pass urine, and also, at the same time, to abolish catheterism altogether, with its irritating effect on the urethra, the inflammation of the bladder might subside, and its tolerance of urine might considerably increase.

This object, it seemed to him, might probably be attained by a proceeding of the following kind: First, placing the patient in the lithotomy position, under ether, he proposes to pass a grooved median staff into the bladder, and make, from the raphé of the perinæum, a small vertical incision just above the anus, large enough only to admit the index finger—the incision to terminate in the staff at the membranous portion of the urethra, which should be divided for half an inch at most, so as to admit the finger to traverse the canal to the neck of the bladder. Then, having withdrawn the staff, he proposes to insert a large vulcanized catheter or tube, say about No. 20 (English scale), with its extremity just within the bladder, fastening it there by tape to a bandage round the waist; the tube to be retained as a channel for the urine, for several days at least.

An opportunity soon offered of making an opening in the manner described, for a patient at the age of sixty, who was passing the catheter every hour, and whose vital powers were at the lowest ebb from constant suffering and loss of rest, but whose constitution was apparently sound; and he placed in the bladder, by the new passage, an India-rubber cathether, so that the urine might flow off continuously into a receptacle as fast as it arrived in the bladder. The relief was immediate, and most remarkable. He enjoyed long periods of unbroken sleep, and was unconscious of any pain; while the urine itself, which had been charged with muco-pus and blood, and had been alkaline and offensive in the highest degree, assumed in the course of a few hours a healthy colour, an acid reaction, and was almost clear. In two or three days, the patient had regained appetite and digestion, became cheerful, and showed a change for the better, which no one had been sanguine enough to anticipate. On the eighth day, he removed the catheter from the wound; during the next two days, urine issued by that route at intervals of some hours; but the wound, which was very small, rapidly closed, and the catheter was, of course, again necessary. But the passing of the instrument was no longer painful; the bladder was not inflamed, and could now retain urine three or four hours without inconvenience; while the patient himself, in less than three weeks from the operation, was enjoying an active life out of doors, having been long confined to his room in the suffering condition which has been described in general terms above.

He saw his patient on the 14th of October last. The report, in his own words, was then as follows: "I use the catheter now only six times in the twenty-four hours, instead of eighteen or twenty times. The urine is a little cloudy—mostly acid, sometimes the reverse. I can drive for two or three hours in the afternoon without pain or fatigue, taking usually a morning walk of a mile or more. My general health is good. The degree of relief afforded by the operation can scarcely be exaggerated."

On the 30th of June last the same operation was performed on a gentleman, eighty-three years of age, who was suffering from unusually painful and frequent micturition, the interval rarely amounting to three-quarters of an hour either by day or night. He could, however, nearly empty his bladder by his own efforts, and required the catheter only once a day; its employment affording very little

relief. It was one of those rare examples of such a condition existing, in which no calculus and no organic changes in the urinary organs could be discovered. As his constitution was excellent, he did not hesitate (his age notwithstanding) to pursue the course described in the preceding one—failing to find, on examination, either tumour of any kind, or calculus. The immediate relief, however, was so great, that he did not remove the Indin-rubber tube from the wound until the twelfth day; and he was then very unwilling to part with it, since he had not been so comfortable for upwards of a year. He had also been able to dispense altogether with the use of morphia, which, up to the time of the operation, he had been compelled to take in full doses. The wound rapidly healed; he retained urine from two to three hours, using his catheter only once in the day as before. Such was the report he gave him in the early autumn, as he left town. During his absence, he ventured to take much more exercise than he had been of late accustomed to, and had a relapse. When he saw him on his return (October 7th), he was gradually improving, and was very grateful for the change; saying he would gladly again submit to the operation, if anything like the old painful condition reappeared, as he had experienced nothing but relief from the proceeding. However, such a course does not at present appear to be necessary or imminent.

Such are two typical cases widely differing; the former an example of a comparatively common condition, the latter one of very rare occurrence. In both instances, he attributes the benefit to a temporary suspension of function in both the bladder and the urethra; in the bladder as a containing viscus, in the urethra as a channel or transmitting one.—*Brit. Med. Journ.*, Dec. 9, 1882.

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Polypoid Tumour of the Bladder.

At the meeting of the Royal Medical and Chirurgical Society, held Jan. 23, 1883, Sir HENRY THOMPSON gave a short account of four cases in which he had removed polypoid tumours of the bladder through the perinæum; an operation of which there have been few examples, and which was worth consideration, as an attempt to deal with growths which, when removed, had always proved fatal. The first case was that of a lady, aged 31, who had been brought under his notice by Dr. Philson, of Cheltenham. The first symptoms of vesical disease were noticed in 1876, when there was frequent and very painful micturition; and subsequently, there was much hæmaturia, and several attacks of acute cystitis. An examination with the sound showed no calculus or definite tumour, but the walls of the bladder were felt to be soft and flabby. The urethra was dilated, and a sessile growth, scarcely pedunculated, was removed from the base of the bladder. There was a good deal of bleeding at the time, but, after a week, micturition ceased to be painful; in three weeks she had control over her urine for four hours at a time. She rapidly regained good health, and there had been no return of the symptoms. An examination of the growth by Mr. Stanley Boyd showed a vascular tumour, with several short pedicles, and a velvety covering of club-shaped processes, about one-sixteenth of an inch long. The second case was of a man, aged 41, whose symptoms dated from 1861. There was great irritability of the bladder, and much painful hæmaturia, which had not been materially relieved by styptics. A suspicion of vesical tumour was confirmed by examination with the finger, and a large mass removed by a central incision through the perinæum. The case, however, was seen in too late a stage to avert a fatal issue. No necropsy was obtainable. The third case was that of a medical man, examined by the sound in connection with Dr. George Johnson and Dr. Cupman, in December, 1880. A note was made at the time, that the walls of the bladder "felt soft," an expression which Sir Henry Thompson was in the

habit of using to describe an abnormal condition, in which the signs of tumours were not definite. Styptics gave temporary relief, but after about six months the symptoms became acute, and recourse was had to digital examination. Polypoid growths were felt and removed by lateral forceps, from the side of the bladder. The recovery was uninterrupted and rapid. The fourth case was of a man, aged 67, short, stout, and heavily built. He had had occasional hæmaturia since 1876, with occasional passage of uric acid calculi. On May 26, 1882, lithotrity was performed at one sitting, and two hundred grains of uric acid were removed. During the summer and autumn, there was much pain and loss of blood, and on January 27, 1883, a digital exploration was made. The perinæum was deep, and the operation presented some difficulties, but a tumour was successfully removed from the base of the bladder. The progress had been favourable on the whole, but some gouty symptoms had developed on January 22d. Microscopical specimens of the tumours were placed on the table. They were all fibromata.—*Brit. Med. Journ.*, Jan. 27, 1883.

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Suprapubic Lithotomy.

This somewhat neglected operation has been done quite a number of times in Paris within the past few years. Prof. Guyon reports in the first number of *Annales des Maladies des Organes Génito-Urinaires*, Dec. 1882, five cases of stone in which he had operated above the pubes within a twelvemonth. In all his operations he adopted the ingenious plan, recommended and practised by Prof. Petersen, of Kiel, of raising the distended bladder out of the pelvis by means of a colpeurynter placed in the rectum, and inflated with air or water.

As suprapubic lithotomies are rather rare, and as these operations were interesting and instructive, we give a brief epitome of them.

I. The first operation was done November 19, 1881, upon a man 72 years old. Nine days earlier an attempt to crush had been abandoned, because the stone was found to be too large and too hard. The method of Petersen was exactly carried out, and antiseptic precautions, including the spray, were taken. The extraction of the stone was very easy. The bladder was not sewed up, but a large red rubber drainage-tube (10 mm. diam.) was inserted into it, and brought out of the lower angle of the wound, and a Lister dressing applied. A rubber catheter (No. 18) was placed in the urethra. The drainage began at once to find its way out alongside of the tube—not through it—and the Lister dressing was soaked, and had to be disused. The catheter provoked so intense a urethritis that it had to be removed the eighth day. The wound was healed the fortieth day. The stone weighed 84 grammes (nearly 3 oz.), dry, and measured 6 x 4 x 3 centimetres.

The patient was in bad condition before operation, but there was little pus in his urine, and it was acid in reaction.

II. The second operation was on a man of 69, in good general condition, with little evidence of cystitis, and none of nephritis. Lithotrity was attempted, and failed, because the stone could not be crushed. Suprapubic lithotomy was done January 4, 1882. A venous plexus was encountered, which bled freely when punctured, but ceased to bleed as soon as the tension of the bladder had been relieved by its incision and the removal of the rubber balloon in the rectum. One suture was placed in the upper angle of the abdominal wound. A drainage-tube doubled into a U-shape was placed in the bladder, a catheter was left in the urethra, and a Lister dressing applied. The patient died in three days of diffuse subperitoneal infiltration. The stone weighed 54 grammes (nearly 2 oz.), and measured nearly 6 x 4 x 3 centimetres (57 x 43 x 28 millimetres).

III. The third operation was done upon a man 69 years old, in good general condition, with no kidney disease and little cystitis. An attempt at lithotrity having failed, eleven days later, March 8, 1882, suprapubic lithotomy was carried out. Two stones were easily removed. Antiseptic precautions were used, and a Lister dressing applied after inserting a siphon tube in the bladder. No catheter was placed in the urethra. The siphon apparatus did not work perfectly, and was replaced with two simple unfenestrated tubes (*"en flûte de Pan"*) introduced into the bladder, and carried over the pubes to a urinal between the thighs. After this the Lister dressing could be used to the end of the treatment. On the eleventh day the tubes were removed, and a catheter placed permanently in the urethra. The patient's wound was completely cicatrized the fifty-first day. Of the stones, one weighed 55 grammes (nearly 2 oz.), and measured 5 x 4 x 2 centimetres. The other weighed 53 grammes (about 2 oz.), and was almost exactly the same size as the first.

IV. The fourth operation was done on a man 57 years old, in bad condition, and in whom lithotrity had failed ten days before. The operation was done May 4, 1882. It was simple. As in the last case, two rubber tubes were placed in the bladder, and two deep sutures placed in the upper angle of the abdominal wound. A Lister dressing was applied (so the account implies). The patient died the twelfth day. The stone weighed 56 grammes (about 2 oz.), and measured 6 x 4 x 2 centimetres.

The author considers this one of those cases an operator would refuse if he aimed only at success in operating, but must accept if he would furnish temporary relief and the only chance of recovery to the sufferer.

V. The fifth operation was done May 20, 1882, upon a man 60 years old, in very bad condition, with a voluminous stone that filled the bladder, and was immovably fixed in such a way that no instrument could be passed *per urethram*. The stone was so firmly fixed in the pelvis and so tightly held by the bladder that no instrument could be passed round it, and it had to be gouged out and broken up before it could be removed—a proceeding which occupied more than an hour and a half. A new siphon arrangement was placed in the bladder, but did not work well, and had to be replaced with two rubber tubes. After the sixth day a catheter was placed permanently in the urethra, and no other means of drainage employed. The Lister dressing (it is to be inferred) was used, and the wound was healed by the fifty-sixth day.

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Treatment of Chancre with Pyrogallic Acid.

At the meeting of the Académie de Médecine of Paris, held January 2, 1883, M. VIDAL advocated the employment of an ointment of pyrogallic acid, 10 or 20 parts to 80 parts of fresh lard or vaseline, in the treatment of phagedenic chancres. Starch may be substituted for the vaseline when it is desired to apply the dressing in the form of a powder.

Under this treatment the ulceration is rapidly arrested, and the chancre takes on a healthy appearance; it is quite as efficacious as the cautery, and only causes burning for a few moments. The dressing should be applied twice daily; both the wound and the skin become black in appearance; the virulence of the sore is destroyed in about three days, and this treatment should be discontinued when granulations appear, and the powder of subcarbonate of iron then applied.

M. Vidal states that absorption only occurs to a limited extent when pyrogallic acid is brought in contact with the subcutaneous cellular tissue; its presence in the urine can be determined by the addition of perchloride of iron.—*Journ. de Méd. de Paris*, Jan. 6, 1883.

Ligature of the Arteria Innominata for Subclavian Aneurism.

At the meeting of the British Medical Association, held in Worcester, August last, Mr. Wm. Thomson read the report of the following case before the Section of Surgery:—

John M., aged 49, a locksmith, was admitted to the Richmond Surgical Hospital, on February 7, 1882, suffering from aneurism of the right subclavian artery. He was a man of good development, healthy looking, and of dark complexion. His hair was grizzled. He had never had syphilis, had lived a fairly temperate life, and had been for eighteen months in America, where, in the war with the Confederate States, he had received a bayonet wound on the right scapula For two years and a half he had been suffering from pains in the right arm, which he thought were due to rheumatism; but, ten months before his admission, he first noticed a small tumour, "about as large as a marble," in the posterior inferior triangle of the neck. He had sought advice at another dispensary, and at our own, but he had refused to come into hospital until he found that the tumour was steadily progressing, and that, in addition to increase of pain, he was unable to work. The tumour, as it now appeared, was globular, and about two and a half inches in diameter, pulsating violently, with evidently very thin walls. It occupied the posterior inferior triangle, its inner margin being close against the outer edge of the sterno-mastoid muscle. The finger passed behind the muscle, received a very strong impulse, and the vessel, so far as it could thus be traced towards its second stage, appeared to be enlarged. The pulse varied from 130 to 140, and was very full. No pulse could, as a rule, be felt in the right radial artery; but occasionally it could be made out as a faint flicker. The arm could not be raised from the side; the pain in the shoulder was unbearable, and the patient lay in bed with his left hand grasping that part tightly, as he said it gave him some relief. The heart-sounds were healthy. The pupils were regular. There was no cough, and no laryngeal irritation. The other functions of the body were natural.

The patient was kept under observation for a week, being at the same time treated with tincture of digitalis, but without making any impress upon the rapidity of the pulse. The majority of opinion, on consultation, was in favour of attempting operation upon the first stage of the subclavian, and, in the event of that proving diseased, upon the innominate. The case was put before the patient, who consented to the proposal; but, after an interview with his son, he declined it. He, however, remained in hospital, and for some time the iodide of potassium treatment was tried, but without any appreciable result. The pulse still continued high, and the tumour increased in size; while the pain in the arm was combated by frequent hypodermic injections of morphia.

The patient suddenly took his discharge on March 30th, as he said he had "private business" to transact. He once visited Mr. Thomson at his house some weeks afterwards. The tumour had then grown to a considerable size, passing upwards in the neck. The pain kept him from sleeping, for he had now no hypodermic injections. The hand was quite numb and œdematous. There was no pulsation to be felt in the radial or brachial arteries. He promised to come into hospital next day, but he did not return until May 22d. He now stated that, during the preceding night, the tumour ceased to pulsate for over an hour. When Mr. Thomson saw him, pulsation was as violent as ever; all the local symptoms were aggravated, but the pulse had fallen to 100. Measured by the callipers, the tumour now marked three inches and a quarter in diameter in all directions. A further consultation was held, and ligature was again determined upon, but on the 29th, the day but one fixed for operation, he was sent for to see the patient. All

pulsation had stopped in the aneurism, which was now hard and tense. He resolved, therefore, to postpone any operative interference. The pulsation returned after about ten hours, and next morning was as bad as before. He had now three-minim doses of tincture of aconite every three hours, but the pulse was not affected.

On the 31st, pulsation stopped for fifteen minutes, but then returned, accompanied by great pain. He was now ordered three-minim doses of tincture of aconite every hour for twelve hours, the effect to be watched. The pulse-rate, which had been 116, was reduced to 96; but next morning the pulse was full and bounding at 100.

On June 4th, the patient said the tumour had ceased to beat several times, but this was not verified by the resident pupil. The pulsation was, however, feebler. During all this time the tumour continued to grow in size, until it reached three inches and a half in diameter at the base. The movement of pulsation was observed over a large area. When he sat up, the shoulder and the whole scapular region rose and fell with each pulsation of the aneurism. The hope which was entertained of spontaneous cure did not appear likely to be fulfilled; and, in face of the fact that the disease was progressing, it was unanimously agreed that operation should not longer be delayed.

Accordingly, on June 9th, the patient, being deeply anæsthetized, was placed in the usual position on his back, with the head thrown well towards the left side. A free incision was made along his clavicle, from the anterior border of the sterno-mastoid outwards, and joined its inner extremity by an incision along the anterior border of the same muscle. The clavicular attachment of the muscle was divided, and turned up, and then the sterno-hyoid and sterno-thyroid were cut to discover the carotid, carefully avoiding the branches of the omo-hyoid plexus, which could be seen. The vessel was of very large size, so much so, indeed, that some of those present thought Mr. Thomson had arrived at the innominate. This belief was encouraged by the fact that, at first, pressure upon it with the finger stopped pulsation in the carotid higher up, and also in the tumour; but this did not always occur, and was evidently the result of a pressure communicated from a distance to the subclavian. He now went further down, in search of the bifurcation; but this was an extremely tedious and anxious proceeding, and he was compelled to divide nearly the whole of the sternal attachment of the sterno-mastoid. Coming at last upon it, the origins of the subclavian and the carotid, at what was an alarming depth, the difficulty of reaching the innominate beyond was increased by the occurrence of a heavy thundercloud, which seemed to shut out all the top light. A mirror was then used to throw light into the wound, but without much good result, and he was here much delayed. The sheath of the innominate was at last slowly scraped through; and, using an ordinary aneurism needle for this purpose, he succeeded in passing it under the vessel, which appeared to be healthy. He then determined to thread it with ordinary silk, and to use this to draw back the tape ligature; but failing in this, as the opening between the sheath and the vessel was too small, he withdrew everything, and, threading a special needle (invented by Mr. Barwell), with the curved portion movable by a lever, he introduced this with comparative ease. He then, before tying, tested the effect of pressure upon the vessel between his finger and the tape, lifting the vessel freely from its bed; and, finding that all movement ceased in the aneurism and in the carotid, he secured the ligature with three knots, drawing the ends with moderate firmness. The edges of the wound were brought together, and a drainage-tube having been introduced into the lower part, an antiseptic dressing was applied and fixed by means of an elastic roller. The arm and shoulder were also swathed in sheets of wadding, which had been previously heated. He was

at once carried to bed; and Mr. Thomson saw him again in about half an hour. The left side of the face was cold, but the pupils were equal. He was only recovering from the effects of the ether; but it was noticed that, when he attempted to ask some questions, he always broke down in the middle of the sentence, and then seemed to be trying to recollect what he wished to say. This was the only symptom of brain disturbance that ever presented itself; and, in the evening, he seemed to have his mental faculties unimpaired. He was ordered ice, milk, soda-water, and beef-tea. Two hours after the operation, the patient complained of pain in the shoulder, and had one-third of a grain of morphia hypodermically; this was repeated in two hours. He slept for three hours during the evening. The evening temperature was 100.6° on the right side; 99.4° on the left; pulse 136. At eleven o'clock, the temperature was 99.6° on the right side; 99° on the left; pulse 120. He had no pain.

The patient did fairly well until July 8th (thirtieth day), when pulsation was visible at the apex of the flap, coming from the position of the innominate. He passed a very good day. At 11.15 P. M. the patient noticed that he was bleeding. The hemorrhage had stopped when he was seen by the house surgeon. Mr. Thomson saw the patient soon afterwards. The wound was examined; there was no bleeding. The dressing was renewed, and a shot-bag placed over all. The amount of blood lost was about three ounces. A hypodermic injection of morphia was given, and ice was ordered.

No further hemorrhage occurred until July 17th (thirty-ninth day). At half-past three this morning a very severe hemorrhage took place. When the residing surgeon saw the patient it had stopped; but the clothes were saturated and the blood lay in a large clot on the floor. The patient was greatly blanched and collapsed. A hypodermic injection of ether was given. He had a cold, clammy sweat and flickering pulse. His voice was a mere whisper. He did not lose consciousness, but said he could not see. The patient then rallied somewhat, and complained of pains in his head and limbs. Increased pressure was made with shot-bags, the dressings not being disturbed. Warm jars were applied to the feet and body. Further stimulation was prohibited. Ice and beef-tea in small quantities were ordered.

July 18th (fortieth day). There was no bleeding; he was very weak; the treatment was continued as before. The pain in the limbs was treated with morphia.

July 19th (forty-first day). He had rallied considerably. His expression was much improved; colour had returned to his face, and his pulse was stronger but jerky. He had pain in the limbs. As his bedding had not been disturbed since the hemorrhage, he was carefully lifted by seven assistants, and a clean mattress, etc., were substituted.

July 20th (forty-second day). He complained of difficulty of breathing at 2 A. M., and much pain. Half a grain of morphia was given subcutaneously. He slept for some time, and died quietly at 8.15 A. M. There was no recurrence of bleeding.

Post-mortem Examination.—A necropsy was made a few hours afterward by Dr. Woodhouse, pathologist and assistant physician, and Mr. Thomson; but, as any interference had been forbidden by the patient's son, this had to be done to a limited degree. Only the parts actually involved in the disease and the operation could be removed. A small opening in the skin was the only part that was unhealed; the rest of the incisions were firmly cicatrized. The diameter of the tumour was 2¼ by 2½ inches. When the skin was reflected, there was no trace of infiltration of parts, and no sign of blood. The opening in the skin led into a small cavity containing about a drachm of pus. When this was removed, the

cavity was found to be about three-quarters of an inch in depth above and slightly behind the right sterno-clavicular articulation, and pointing downwards, backwards, and inwards. It received the end of the little finger like a thimble. The tumour itself was covered by skin and platysma, and some outer fibres of the sterno-mastoid muscle; the omo-hyoid was stretched across it. The phrenic nerve passed along the inner side, borne off by the anterior scalenus. The muscle was bulged forwards, but the nerve did not seem to be pressed upon. Across the whole surface of the tumour were, lightly stretched and flattened, large roots and branches of the brachial plexus. In the anterior inferior triangle, the tissues overlying the great vessels were so matted together that thay could be dissected with difficulty, especially at the lower part of the carotid. The internal jugular vein was collapsed. The common carotid artery was full and firm to the touch as far as the bifurcation. The subclavian vein was empty, and was tightly stretched along the lower and anterior part of the tumour. Its coats were thin, and in two places, near the junction of the internal jugular, there were small translucent patches, apparently from thinning of the internal coat. A few drops of pus oozed out of the lower end of the carotid into the ulcer which terminated the sinus. On turning forward the anterior scalenus, the aneurism was found to involve the second part of the artery. The tumour rested upon the first rib, and pressed against the clavicle in front. These bones were removed, the rib with its attachment to the aneurism, and as much of the aorta as could be reached was cut across, and the parts taken out *en masse*.

The tumour was found to spring from the posterior part of the second and third stages of the subclavian artery. It was flattened below, where it rested on the rib, and passed upwards for three inches, ending in a dome-like surface. Corresponding to the position of the clavicle it was constricted. Its clavicular portion measured 2⅛ inches antero-posteriorly; its basal, 2⅜.

The artery was elsewhere normal in size. It formed a cord from which the tumour sprang. The axillary portion, so far as it could be removed, was firmly plugged. All the vessels of the first stage were traced, and were pervious.

The ulceration, which was somewhat larger than a sixpence in area, was situated at the bifurcation of the innominate into the subclavian and carotid arteries. It involved the anterior portion of the three vessels, and looking into it, the clots blocking the three vessels could be seen. The surface was gray and shreddy. There was no staining of blood visible. The vessels were partly slit, and a syringe was used to force water through in the direction of the ulcer, but although this was carefully tried with each vessel, not a drop passed through. The incisions were extended along the vessels towards the ulcer.

The wall of the innominate was thickened almost from its origin, and this thickening increased gradually as the side of the ligature was approached until the depth was about two lines. The clot was firmly adherent to the walls, and extended backwards through the greater extent of the vessel. At its cardiac side was a small tongue of organized clot rather loosely attached; and between it and the firmly adherent clot were some retiform bands of fibrous tissue deeply stained with blood.

The subclavian was found to be empty, except at its cardiac end, which was well blocked with a firmly adherent clot. This projected towards the aneurism for about half an inch. No water could be forced through.

The common carotid felt solid, but on opening it, it was found that the centre of the clot had degenerated, and was occupied by pulpy purulent material. The walls of the vessel were thickened. The clot terminated near the bifurcation into the external and internal carotids.

The aorta was thickened, atheromatous, and, in patches, calcareous. The lung and pleura as seen on the right side were healthy.

An incision was made into the aneurism from summit to base. It contained about half an ounce of dark, thick blood, and in the centre was some passive clot occupying a cavity about the size of a walnut. The process of cure was evidenced by fibrinous layers upon the walls to the extent of a third of an inch, and on the inner sides of this coating were masses of coagulum less firm, but evidently undergoing consolidation.

A prolonged and careful search was made for traces of the ligature, but none could be found. On the posterior of the innominate, opposite the ulceration, was some fatty tissue intimately adherent to the wall, which could with difficulty be cleaned.

A more minute examination of the parts was subsequently made. The vessels were all divided into the ulcer. This showed that the innominate had been constricted at about a quarter of an inch from the cardiac margin of the ulcer. The walls were not divided, and the ulcer had not taken origin at the seat of the ligature. The vessel was not occluded by adhesion of the inner surfaces, but a chink remained at the ligatured portion through which the clot continued, and had been united to the clots in the subclavian and carotid. The clot in the subclavian was well established. The ulcer had eaten into the clot in the innominate at its centre, and had in this way caused the hemorrhage.

In order to search for the ligature, an inch of the posterior wall of the innominate was cut out, and several sections of it were made by Mr. P. S. Abraham, Curator of the Royal College of Surgeons' Museum, but no trace of it could be found. The coats of the vessel were undivided.

In commenting on his case, Mr. Thomson says: "I believe that ligature of the arteria innominata may be safely done. A careful study of the cases which have been published will show how very near many of them came to success. Mott's case, and Gräfe's, were up walking about before the wound was absolutely closed, and it was owing to some indiscretion that the recent adhesions were torn and that hemorrhage was set up. In Gräfe's, Mott's, Lizar's, Gore's, Bland's, and Bickersteth's cases, the innominate was more or less occupied by firm clot. The carotid was occupied by a clot in Gore's, Arendt's, Mott's, Lizar's, and Bland's cases. The subclavian was closed in Smyth's case (after ligature of the vertebral), almost up to the thyroid axis; and in Arendt's. It is to be observed, with reference to these facts, that in some of the reported cases details are not given; and that in others the patients did not live long enough for such processes to be set up effectively. Here, at all events, in a considerable proportion of cases, we have that condition present which is regarded as one of the essentials of success in deligation of an artery in its continuity. The clot is found to be present, not only in the innominate, but also in the two large vessels which branch off from it. Death in the majority of cases, however, resulted from hemorrhage, and this chiefly from ulceration of the ligature through the vessel, and an absence of sufficient adhesive power in the tissues so divided to make closure permanent. It was an accidental result, if I may call it so, not a result to be looked for as a necessity. The possibility of obtaining obliterating clots in the innominate, subclavian, and carotid, or in the innominate and carotid, being shown, it only remains that, to make a long stride forward to success, we should use an antiseptic animal material which will not divide the vessel, but only keep its walls approximated for a sufficiently long time. So we find Mr. Lister declaring that, using such a material, 'for my own part I should now, without hesitation, undertake ligature of the innominate, believing that it would prove a very safe procedure' (*Lancet*, April 3, 1869). It was with a like belief that I undertook this operation.

"It is true, I regret to say, that in my case the old tale of hemorrhage was repeated; but there can be no doubt that it was not here set up by the ligature cutting through the vessel. The position of the ligature is only marked by a constriction, and the margin of the ulcer does not come within more than a quarter of an inch of that line. The coats are not divided, and the ligature appears to have done its work by gripping the vessel until a well-organized clot was formed. The clot had also formed on the distal side, so that the ulcer, as in most cases, had for its lateral walls nothing but organized clot in the three vessels. This clot was gradually thinned by the ulcerative process, and at last, as I believe, a weak spot in the portion in the innominate yielded to pressure and gave way. It may be said here that the purulent degeneration of the centre of the clot in the carotid was probably due to the access of pus from the ulcer.

"But, it will be asked, what produced the ulceration, and why did my case fail if I used the precautions which I have faith in? My answer is, that the ligation did not fail. It held the vessel until a firm, organized clot was formed; and that if an ulcer had not formed, at a distance from the ligature be it remembered, the patient would have recovered. The history of the ulcer is associated with the use of the drainage-tube. This I left in for about six days, except when it was removed to be cleaned. When it was finally removed, it left behind it a sinus leading down to the bottom of the wound. The wound was then perfectly aseptic, the patient's temperature normal, and everything going on well. But this track, holding some discharge, provided a nest for septic organisms when these unhappily got access. From that on the vessel was subjected to the eroding action of pus, small in quantity though it was, as it lay in a pocket on the face of the vessel. Knowing what had happened in Mott's case, I correctly feared that an ulcer had formed; and although I did all that I could, its action could not be stayed. How the evil originally arose I can only surmise, but I believe it was owing to the difficulty of keeping the dressing in accurate position at the neck.

"Judging from my experience, I should certainly, in another case, remove the drainage-tube early, and endeavour to get speedy closure of the wound in its deeper parts. It is to be borne in mind that there is much retraction of the tissues, and that a large hole is left after the operation is terminated. The skin is brought together and heals much more quickly than the deeper parts, which are not approximated in the same way. The clavicle also assists in keeping the soft tissues from falling together and getting an early closure. This has happened in every case on record, and it adds enormously to the risk. To overcome this I should, in another case, apply carefully adjusted sponges outside the dressings, and over these place light shot-bags (a few ounces) so secured that they would exert constant and moderate pressure upon the wound. The head should also be brought well over to the right side, so as to relax the tissues, and by that means an effort be made to aid the rapid consolidation of the parts.

"It has been suggested by some surgeons that, in such an operation as this, the carotid ought to be ligatured at the same time, with the object of cutting off the reflux current of blood from contact with the seat of ligature on the innominate. Thus Barwell (*On Aneurism*, p. 53) thinks this question 'demands of necessity an affirmative answer. Blood will at once, when the innominate alone is ligatured, find its way through the carotid into the subclavian in quantity large enough to compromise the cure. The ligature on the carotid does not complicate the operation, nor add to—indeed, it rather subtracts from—the danger.' But, as a matter of fact, the history of the cases shows that it is not necessary. In a large number, as in my own, a clot had formed up to the bifurcation of the carotid and occluded it. In Smyth's case, which was successful after ligature of the vertebral, he tied the carotid at the time of ligaturing the carotid, but that did not

save him from fearful hemorrhage. It was only when the vertebral was secured on the fifty-fourth day that I relieved my patient from the risk of death. I believe that a return circulation had been set up through the vertebral, and that, as it was likely a clot had not formed in the first stage of the subclavian in consequence, the securing of this vessel would prevent further hemorrhage. The other vessels in the first stage, however, remained unsecured, and the flow of blood through them remained. Whether the ligature of the solitary vessel had the desired effect, or whether it was simply a case of *post hoc ergo propter hoc*, it is impossible to say. The proposal to examine the parts was made by me at the time of consultation, allowing some interval after the bleeding to elapse; but the opinion was against me, and I did not feel justified in taking the responsibility of acting. It could not have been done without putting the patient under ether, and there was danger that his struggles would have brought on fatal hemorrhage. As the *post-mortem* examination showed, no further operation would have been successful."—*Brit. Med. Journ.*, Oct. 14, 1882.

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Syme's Amputation.

Every one knows that Mr. Syme attached very great importance to certain details of the admirable operation of amputation at the ankle-joint that goes by his name. He insisted especially upon the position of the incision across the sole. "The foot being placed at a right angle to the leg, a line drawn from the centre of one malleolus to that of the other, directly across the sole of the foot, will show the proper extent of the posterior flap. The knife should be entered close up to the fibular malleolus, and carried to a point on the same level of the opposite side, which will be a little below the tibial malleolus." Thus he laid it down, and he dissected the flap off the os calcis from below upward. These directions were for a long while rigidly observed, but of late years surgeons have been less particular in the direction of the incisions. That across the sole is often made obliquely backward, at the expense of the flap. The incision across the front of the joint is also varied, sometimes being quite transverse, at others curved towards the toes. With regard to the heel, of course the more obliquely backward the incision of the sole is made the less difficulty will there be in the reflection of the flap, if done from below upward; but it seems of importance to preserve at least the whole of the heel, so that it is best to make the incision a vertical one. The thick integument of this region forms so capital a pad on the extremity of the stump that care should be taken to secure the whole of this, and to bring it well forward in the first instance, for during repair and afterward there is a tendency in this to be drawn backward. Of course it will not be forgotten that after this operation the person stands and walks directly upon the extremity of the stump. With regard to the particular points where the extremities of the vertical incision should be, some surgeons keep them both on a level with the external malleolus, but Mr. Wm. S. Savory prefers to have them rather more forward—that is to say, on a line with the extremity of the internal malleolus, but not extending higher than the level of the external one, for the base of the flap is thereby so much broader. This is, he thinks an advantage, and there is no objection to it. But of all changes in the operation he should attach most importance to the way in which the dissection is done. He greatly prefers, after making both incisions, to open the joint from the front, and then to work from above downward. This mode of dissecting out the os calcis is far easier than the original plan of dissecting from below upward, and there is less danger of inadvertently cutting into the substance of the flap. He has adopted this plan now for several years in many cases, and he cannot doubt that

it is a much better one of performing the operation. By dissecting out the os calcis from above downward, and so escaping the only difficulty in the operation—that of turning off the heel—there is no temptation, as in the other way, by carrying the first incision obliquely backward, to sacrifice some portion of the flap.—*Lancet*, Feb. 3, 1883.

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Resection of Several Ribs in Empyema.

Dr. BRUGLOCHER (*Aerztl. Intell.*, No. 31, 1882) contributes a paper on this subject, advocating the practice of resection of several ribs in cases of long-standing empyema in adult patients. He regards the excision of a small piece of rib, as accessory to the ordinary method of opening the pleural cavity, as accepted by the profession at the present time; the proceeding being a matter of indifference to the patient, but of decided value in its results. The ultimate results of operation for relief of empyema are found to be uniformly more satisfactory in children than in adults. The explanation of this fact he finds in the greater elasticity of the chest-walls, which adapt themselves to the diminished size of the compressed lung, and thus assist in lessening the size of the pleural cavity. This retraction of the chest-walls can only take place to a very limited extent in the more rigid adult thorax, and hence the recovery is prevented by a purely mechanical agency, which admits of removal by mechanical means. Resection of ribs has generally been undertaken only as a means of facilitating the continued escape of pus from a suppurating pleura; here, however, one has to do with a plastic operation, the result of which depends, amongst other things, upon the mechanical exactness with which it is carried out. Several authors have practised and recommended this method, which was first suggested by Simon. As the result of an investigation into the work of several authors, Dr. Homen, of Helsingfors, lays down the rule that, in cases where two to three months have passed between the commencement of the disease and the formation of a fistula, and where recovery has not taken place in from four to five months afterwards, no hope can be entertained of recovery by ordinary means. The details of a case are related in which a simple serous pleurisy in a man, aged 45, was treated at first by puncture, with apparent success. Six months later, a painless swelling became developed in the right side in the axillary line, dulness and absence of respiratory sounds being noted, extending as far upwards as the middle of the shoulder-blade. Its contents being found to be purulent, the tumour was incised, three months after its first appearance, and a portion of the eighth rib, about one inch, removed. The whole operation and subsequent treatment of the wound were carried out strictly antiseptically, and the discharge from the opening was but very slight, but recovery did not take place. Ten weeks after the operation it was found that a cavity still remained, allowing a probe to pass three inches from without inwards, and four and a quarter inches upwards. Free resection of the fourth, fifth, sixth, seventh, and eighth ribs was then performed, three and three-quarter inches being removed from the lowest, and one and three-quarter inches from the highest of these, and from the intermediate ribs gradually increasing lengths. The pleura was not opened in any fresh place. By various methods of calculation, Dr. Bruglocher arrives at the conclusion that the length of rib to be removed must about correspond with the distance between the pulmonary and parietal pleura, and the resection must be carried upwards in gradually decreasing extent to the point where the two surfaces of pleura are again in contact. The results obtained in this case were satisfactory; the falling-in of the chest-wall was ultimately followed by complete healing of the sinus.—*London Med. Record*, Dec. 15, 1882.

Resection of the Ankle.

Prof. Busch, of Berlin, describes in the *Centralblatt für Chirurgie*, No. 41, 1882, a new method of resecting or simply of exposing and clearing out the ankle, in cases of fungous inflammation of this joint. The ordinary operation by two lateral incisions does not, it is held, expose the interior of the joint to such an extent as to enable the surgeon to determine the amount of disease. Hueter, who recognized this difficulty, exposed the joint by forming a flap on its anterior surface. This proceeding has not been received with much favour, as it necessitates division, not only of several important tendons, but likewise of vessels and nerves. If the flap be formed from the posterior surface of the joint, the tendo Achillis must be divided, and the strength of this structure, even though it be united again by sutures, will necessarily be much impaired. On September 5, the following operation was performed by Dr. V. Hösslin, under the direction of Prof. Busch. An incision was carried from malleolus to malleolus across the sole of the foot, inclining backwards towards the greater tuberosity of the os calcis. The soft parts of the sole were divided down to the bone. The tendinous and other soft structures behind the bones on each side of the joint were then carefully detached and drawn forwards, so that the lateral aspects of the joint were freely exposed. The os calcis was then sawn through in the direction of the external wound, from the anterior margin of the greater tuberosity, obliquely upwards towards the anterior margin of its articular surface with the astragalus. The posterior fragment having been elevated, the posterior ligamentous structures of the ankle were cut through, and the exterior of the joint freely exposed. In this case, as there was extensive disease of bone and synovial membrane, with much ulceration of cartilage, it was thought necessary, in addition to cutting away the fungous growths within the joint, to extirpate the astragalus, and to remove the softened and diseased portions of the bone at the extremities of the tibia and fibula, and on the upper surface of the os calcis. The interior of the wound having been disinfected, the posterior fragment of the os calcis was replaced and fixed by two wire sutures. The wound was drained and dressed antiseptically. Prof. Busch anticipates that if the patient—a young woman aged eighteen—remain free from tuberculosis, a movable and useful joint will be formed in this case between the bones of the leg and the upper surface of the os calcis, the limb of course being slightly shortened in consequence of the removal of the astragalus. There is no reason, it is thought, to doubt the future union of the fragment of os calcis; and the cicatrix across the sole, as it is situated in front of the greater tuberosity, is not likely to cause any trouble.—*London Medical Record*, Jan. 15, 1883.

OPHTHALMOLOGY AND OTOLOGY.

New Method for Dilating the Lachrymal Passages.

Dr. Galezowski (*Recueil d'Ophthalmol.*, Aug. 1882) has for the last six or seven months been using forcible rapid dilatation of the nasal duct, without incision, for the cure of stricture. He has found that by the use of his dilator he can effect the cure of even long-standing strictures in a month or six weeks; and quotes cases in which after Stilling's method, followed by the use of Cooper's probes, had failed, his dilator was successful. His method is as follows: Having divided the canaliculus, as in Stilling's operation, he introduces his dilator, and

passes it, closed, down through the nasal duct. He then withdraws it slowly, pressing with his finger as he does so a lever which forces asunder the jaws of the dilator. The closed instrument is about the size of one of Bowman's No. 4 probes. When the jaws are separated it represents a probe of the size of Cooper's largest. This dilatation is made without the loss of a single drop of blood, and without, relatively, very much pain. The operation is usually followed by no inflammatory reaction, unless in cases where suppuration already exists, in which case he applies poultices, etc., for a day or so after. On the third or fourth day he is in the habit of introducing a small sound to assure himself that the nasal duct is quite free, and if so he either then, or the next day, introduces a large sound (No. 10 or 12 of his collection). This passes, usually, without the least difficulty and with little pain. He does not again pass a probe for five or six days. . This is again repeated in another five or six days, and so on for three or four times, when the stricture is cured.—*Dublin Journ. of Med. Sci.*, Jan. 1883.

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Movements of the Eyes provoked by Pressure on a Diseased Ear.

At the meeting of the Ophthalmological Society of the United Kingdom, Dr. HUGHLINGS JACKSON described a case which resembled one reported by Schwalbach, and was important as a demonstration that ear disease is one cause of, or one factor in, producing vertigo. It was a clinical illustration of one of Cyon's experiments on the semicircular canals of rabbits. The patient, a woman aged 49, had suffered from otorrhœa on the right side from childhood. She had recently become subject to attacks of auditory vertigo, and had a peculiar unsteady gait, resembling that produced by alcoholic intoxication. Pressing on the tragus of the right ear caused certain definite movements of both eyes; first, the eyes moved slowly to the left; then they moved back again, by jerks, to the right; at the same time she felt giddy, and there was apparent displacement of objects to the left. This displacement was synchronous with the slow movement to the left. The patient was examined by Mr. Laidlaw Purves and by Mr. Couper; and, under treatment, by syringing the ear, and the internal administration of quinine, she improved so that only the very slightest movements of the eyes were producible by the pressure spoken of. Dr. Jackson referred to researches by Dr. James, of Boston, U.S.A., which seemed to show that deaf mutes were not easily made giddy by rotatory movements, and were not at all liable to sea-sickness. He thought that the procedure mentioned in this case, might probably be helpful in the diagnosis of some difficult cases; and that the different results obtained at different periods in such cases would be some measure of the patient's progress. So far as it was possible to do so Dr. Jackson had satisfied himself that the apparent movement of objects was synchronous with the *slow* movements of the eyes, and was in the *same* direction as these latter.—*Ophthal. Review*, Feb. 1883.

MIDWIFERY AND GYNÆCOLOGY.

The Peritoneal Uterine Suture in Cæsarean Section.

One of the main causes of the mortality after Cæsarean section, and one which makes success almost a matter of luck, if we may use the word, rather than of surgical skill, is the gaping of the uterine wound, and consequent escape of uterine secretions into the peritoneal cavity. In some cases the uterus contracts well, and remains contracted; consequently the edges of the uterine wound remain in apposition, and unite, with or without sutures, and these patients usually do well. In others, uterine contraction is not permanent, but intermit-

tent; and in the relaxation of the uterus the sutures are often torn out, and the wound gapes, lochia escapes into the peritoneum, and septicæmia and peritonitis is the result. Consequently, obstetricians have long felt that the primary step needed to make Cæsarean section not more dangerous than other abdominal operations of equal magnitude, is the discovery of a method of suture which can be relied on to keep the edges of the uterine wound together. In a recent number of the *Archiv für Gynäkologie*, Dr. LEOPOLD, of Leipzig, describes a successful case of Cæsarean section in which he adopted a new method of suture. This method was, in principle, suggested to him by Sänger—a paper by whom, "in defence of the classical Cæsarean section," appears in the same number. Sänger's paper is largely devoted to criticizing the suggestions of Kehrer. The method of suture adopted by Leopold is based on the principle upon which ovariotomists act, and at which Mr. Spencer Wells arrived by those few experiments upon animals for which he has been so much abused in antivivisection pamphlets, and has so needlessly defended himself. That principle is the bringing together, in closing abdominal wounds, surfaces of peritoneum. To do this in closing the uterine wound, Dr. Leopold dissected up the peritoneum bounding the wound from the muscular tissue underneath to the extent of about one-fifth of an inch at the upper and lower angles, and rather more than one-third of an inch along the sides. Then he cut away the whole thickness of muscular tissue from which the peritoneum had been thus stripped. The freed peritoneum was then turned inwards so that it covered the edges of the wound, and was united with carbolized silk sutures, so that the surfaces of introverted peritoneum were brought into contact. The patient, as we have said, did well. One successful case of course proves little; but, as an attempt to solve a difficult problem, this seems to us worth notice.—*Med. Times and Gaz.*, Jan. 27, 1883.

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The Treatment of Placenta Prævia.

A recent number of the *Zeitschrift für Geburtshülfe und Gynäkologie* contains an article of practical interest on the above subject by Dr. M. Hofmeier, of Berlin. It is based upon 46 cases which have been under his care. None of them were primiparæ. Of these, 3 were beyond the reach of treatment when first seen, one of these being dead when Dr. Hofmeier arrived, another dying three-quarters of an hour before delivery, and another two hours after delivery. Putting these aside, there remain 43. Of these, in 19 the implantation of the placenta was central, in 16 lateral, and in 8 marginal. The principle of treatment which Dr. Hofmeier regards as most essential is the termination of the labour as quickly as possible. The practice of temporizing by plugging until the dilatation of the cervix has proceeded far enough to admit of ordinary podalic version he regards as bad. When the case is seen early, the one step which is the more clearly indicated the earlier the case is seen, is bipolar version after the method of Braxton Hicks, one or two fingers only being passed through the os uteri, and then extraction of the child effected as gently as possible. By means of this operation the accoucheur can proceed to hasten delivery without much trouble to himself about the condition of the cervix. In 37 of Dr. Hofmeier's cases this principle of treatment was acted on: in 19 of them the cervix being nearly or quite dilated; in 18 little or not at all. In 30 cases bipolar version was performed; in three it was only necessary to bring down a foot, as the pelvic extremity of the child presented; in 3 version was accomplished by the ordinary method of introducing the hand into the uterus; and in 1 case delivery was effected by forceps. In 5 cases in which the cervical canal was not dilated, and the placenta was implanted centrally, Dr. Hofmeier perforated the placenta and

drew down a foot through the hole. In two of these there was reason to think that the child was already dead, and in the other three profuse hemorrhage was going on. After delivery, ergotin was injected subcutaneously, and the uterus syringed with a 5 per cent. solution of carbolic acid. Our author combats the theoretical objections brought against the method of Hicks by some German writers, that it is difficult, and only suitable for immature children. He says—and we think accoucheurs who have followed the teaching of Dr. Hicks will agree with him—that it is easy, and suitable when the child is large as well as when it is small. Of the 37 cases treated by Dr. Hofmeier, in 17 he judged that the child had died before delivery. Of the remaining 20, 6 died in the process of birth, 3 of them being premature, and 3 as the result of perforation of the placenta. The gross infantile mortality therefore was 63 per cent. The average infantile mortality given by various writers who have collected cases is from 60 to 65 per cent. Of the 37 mothers only one died; a mortality of 2.7 per cent., which Dr. Hofmeier contrasts with the average mortality of 30 to 40 per cent. Of the 6 other cases treated upon a more expectant plan, 1 mother and 4 children died. Taking with these the 3 who did not come under care until too late for treatment, Dr. Hofmeier's figures show 5 deaths out of 46 cases, or a mortality of 10.8 per cent. While congratulating Dr. Hofmeier upon his low mortality, we yet think the figures are too small to show decidedly that it is due to more than good fortune. Dr. Barnes states in his work on Obstetric Operations that he had 29 consecutive cases without a death, and yet his total mortality was 1 in 11½. It appears to us that the dilatation of the cervix by India-rubber bags, as recommended by Dr. Barnes, and by the thigh and half-breech of the child, as practised by Dr. Hofmeier, have this in common: that they substitute soft, gentle pressure, uniformly applied to a large extent of the cervix, for the violent pressure of the operator's knuckles against a few points of the cervix, which is an inseparable part of the *accouchement forcé*, *i. e.*, the violent forcing of the hand through the undilated cervix for the purpose of effecting podalic version. We are inclined to think their good results largely due to this improvement.—*Med. Times and Gaz.*, Feb. 24, 1883.

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Radical Cure of Prolapsus Uteri.

Dr. CANEVA, of the Ospitale Maggiore at Milan, comments, in the *Gazetta degli Ospitali* of December 20, 1882, on the unsatisfactory results of mechanical supports, and of vaginal plastic operations, in the treatment of complete uterine prolapsus. He recommends an alternative operation, with the object of suspending the womb from above, by promoting adhesions between its body and the parietal peritoneum in the hypogastric region. The patient is to be kept in bed for some days before the operation, to maintain the uterus reduced. The bowel having been cleared by injection the previous evening, and the bladder emptied just before anæsthetization, whilst the patient is lying on her back, the operator introduces a metallic sound, and entrusts it to a competent assistant, with instructions to maintain the anterior surface of the uterus in contact with the abdominal wall. Commencing at a point two inches from the pubis, an incision is to be made three inches upwards along the linea alba down to the peritoneum over the body of the womb, which can be felt by the finger with increasing distinctness as the division of successive layers proceeds. So soon as the peritoneum is reached, the most delicate stage of the operation is entered upon. The wound is to be enlarged transversely, and an area of peritoneum at least an inch and a half in diameter exposed, by drawing aside the margins of the wound and detaching the serous membrane with the handle of the bistoury or with the finger.

The assistant holding the womb fixed with the sound against the exposed peritoneum, the operator, with a fine needle threaded with catgut, sutures the parietal peritoneum to the corresponding serous investment of the womb. The sound is not to be withdrawn until the surgeon has satisfied himself that the proceeding has resulted in the effectual suspension of the uterus to the abdominal wall. In closing the wound, two or three of the stitches are to include the peritoneum. The whole procedure is to be conducted with strict antiseptic precautions and Listerian dressings. Dr. Caneva has not given any clinical results, but promises a further contribution.—*Lancet*, Jan. 6, 1883.

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The Etiology of Fibrinous Polypus of the Uterus.

In a recent number of the *Zeitschrift für Geburtshülfe und Gynäkologie*, Dr. Ludwig Joseph, of Landeck, relates a case of fibrinous polypus of the uterus, quite exceptional in its origin, and of much interest for several reasons. A fibrinous polypus, as our readers are aware, is essentially a blod-clot, which has adhered to some part of the uterine wall, has consequently been retained in utero, and has undergone the changes which blood-clots in the living body usually do undergo — decolorization, shrinking, and hardening. The typical history of these cases is that a young woman goes from six to twelve weeks without menstruating, and then begins to lose blood copiously. When the uterus is thoroughly examined, a fibrinous polypus is found, removed, and the hemorrhage ceases. Kiwisch, because he found no trace of fœtal membranes in polypi of this kind, taught that they occur quite independently of pregnancy. This view was controverted by Scanzoni and C. Braun, who believed that they always occurred as a sequel of abortion or labour. One case has been described by Rokitansky in which post-mortem examination showed a body like a fibrinous polypus, except that it was not adherent, in a uterus which presented no sign of pregnancy. Dr. Joseph's patient was a widow aged fifty-five, who had ceased to menstruate at the age of forty. For nine months before coming to him she had suffered from uterine hemorrhage. The uterus was retroverted and flexed, enlarged, and fixed. Under palliative treatment the hemorrhage was reduced, and four weeks after treatment (by rest and mineral acids) a retort-shaped solid mass was passed from the uterus. It measured about three inches and a quarter long by one inch and a half in thickness, and consisted of laminated, partly decolourized fibrin, embedded in which was a very vascular myomatous tumour, the size of a hazel-nut. Dr. Joseph's theory of the case is, that the myoma caused hemorrhage: that the flexion offered an almost insurmountable obstacle to the outflow of blood, which was therefore retained, and underwent the usual changes. He does not explain how it was that the flexion, which would not allow fluid blood to pass, yet allowed this solid mass to escape. The interest of the case is in the fact that it shows that the fibrinous uterine polypus is not invariably connected with a previous pregnancy.—*Med. Times and Gaz.*, Feb. 10, 1883.

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Martin's Operation.

A case of this operation is published by Dr. Möricke in a recent number of the *Zeitschrift für Geburtshülfe und Gynäkologie*. The case came under the care of Dr. Möricke while he was in charge of Professor Schroeder's wards, during a recent illness of that distinguished gynæcologist. The patient was aged thirty-five, suffered from pain and hemorrhage, and was very anæmic. The uterus was about the size of one four months pregnant. The cervical canal admitted the finger, and thus a broad-based tumour could be felt springing from

the anterior wall of the cavity. Beside this, a fixed tumour, as big as a good-sized apple, and closely connected with the cervix, could be felt behind the uterus in the hollow of the sacrum. The patient was perseveringly treated with ergotin, and then by scraping the uterine mucous membrane with a sharp spoon, without any persisting benefit. "Martin's operation" was then performed antiseptically. The abdomen was opened, the uterus was made to protrude through the wound, and its anterior wall incised till the tumour was got at. This was then shelled out of its bed, and removed. A thick drainage-tube was inserted into the uterus, and made to emerge through the vagina. The uterine wound was sewn up with numerous closely set sutures, and the abdomen closed in the usual way. The operation lasted three-quarters of an hour, and the amount of blood lost was very slight. The operation was followed by remittent pyrexia; and on the tenth day an inflammatory exudation was perceptible in the left lower belly. The drainage-tube was removed on the nineteenth day, as secretion then ceased to flow from it. On the forty-sixth day a quantity of fetid pus was discharged from the vagina. The pyrexia after this abated, and the patient left her bed on the seventy-sixth day after operation. The temperature again rose, however, the patient wasted, and died 111 days after the operation. The autopsy showed peritonitis with sero-fibrinous exudation; a collection of pus in each broad ligament; almost complete involution of the uterus; the endometrium healthy. The cervical tumour was a myoma. Dr. Möricke thinks Martin's operation is strongly to be recommended, in the strictest sense "an ideal operation."—*Med. Times and Gaz.*, Jan. 13, 1883.

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Total Extirpation of the Uterus through the Vagina.

At the recent Congress of Physicians in Eisenach, OLSHAUSEN reported that he had performed total extirpation of the uterus 23 times. Of these, 3 operations were not completed; one on account of rectal and two on account of vesical adhesions; one case has a vesico-vaginal fistula as a sequel, and another an intestino-vaginal fistula. Of the remaining twenty cases, 6 died. In nineteen cases there was carcinoma of the cervix; in three, sarcoma of the body of the uterus; in one case the operation was performed on account of myoma of the posterior wall of the cervix. Of the survivors of the operation, in three the disease reappeared, and of these, two died.

In the last 10 cases, he had employed the elastic ligature exclusively, with carbolic acid irrigation, drainage tube in Douglas's pouch, and iodoform gauze. In the discussion which followed, MARTIN reported that he had made 31 operations, in 5 of which, all the diseased tissue could not be removed; of the twenty-six others, 4 died. He commenced with opening the posterior arch of the vagina and then ligatured the tissues that were to be divided, so avoiding all loss of blood; he always employs drainage. His results were not successful as regards return of the disease, as of all these cases only one remained one year and a half free from the disease.

KEYKLMANN stated that he had never seen a case of operation for carcinoma in which a permanent cure was obtained; he thought therefore the operation should be reserved for cases of adenoma.

Olshausen, Veit, Rinecker, and Martin were opposed to the view, as they have all seen cases in which long-continued or permanent relief has been maintained.—*Centrlb. f. Chirg.*, Jan. 20, 1883.

Double Ovariotomy and Resection of Portions of Bladder and Ileum for Carcinoma.

SCHUSTLER has recently recorded (*Wiener Med. Woch.*, Nos. 2 and 3) an extraordinary case of operation by Billroth. The patient, a woman aged twenty-nine, married at the age of eighteen, and had five children without any trouble; but the sixth pregnancy ended, four years ago, in the expulsion of a decomposing fœtus of about six months, since which time leucorrhœa was constantly present. Nineteen months ago the patient was delivered of a healthy child. But the first signs of illness dated from the miscarriage, and were pain increasing in severity, fever, and tenderness on pressure about the lower part of the abdomen; later on, shortness of breath and palpitation were complained of, and to these were soon added disturbances of micturition and defecation. The chief point made out on admission, in October, 1881, was the detection of apparently two tumours in the abdomen, to some extent connected with one another. One was situate in the right iliac fossa, and was about the size of a man's fist. The second was separated from this by a furrow, and was the larger of the two, reaching from the right swelling into the left iliac fossa along Poupart's ligament, while upwards it nearly reached the false ribs. The tumours were but little movable, and admitted of but little motion one on the other. Both tumours were irregular on the surface, of dense consistence, and no fluctuation was detected. The diagnosis was: new growth in both ovaries, with ascites. The patient growing worse, an operation was performed for the removal of the tumours on October 18, 1881. Antiseptic treatment, without the spray, under deep narcosis, was adopted. A median incision was made at first from the navel to the pubic symphysis, but had to be extended for about an inch above the navel. Some loose adhesions were easily broken down, but this was not the case with others near the symphysis pubis, on account of which Billroth found it expedient to remove a piece of the bladder about an inch long, and not so wide. The urine had been previously drawn off, and only a few drops were seen in the viscus. An assistant seized the edges of the wound, and held them up, and so prevented the escape of urine into the peritoneal cavity. The bleeding was slight. Six silk sutures were used to sew up the bladder. But it was found necessary to resect also a portion of the small intestine, owing to the firm union which existed between the bowel and the tumour. Rather more than three inches of the length of the ileum were in this way removed. The corresponding mesentery was secured in five parts by double ligatures. The two cut ends were brought together first at the site of the insertion of the mesentery by five silk sutures after the manner of Wolfler, and the remainder of the lumen was then closed. With a little more trouble the enlarged left ovary was removed, Paquelin's cautery being used to divide the pedicle. The *right ovary* was afterwards got out without much difficulty. After the toilette of the peritoneum had been thoroughly carried out, the abdominal wound was closed by deep and superficial sutures; no drainage was employed. A firmly applied iodoform gauze dressing was used. The further course of the case was very favourable. The temperature never rose above 100° Fahr. For the first two days nothing but a little egg albumen was taken; on the third day a spoonful of milk and meat broth, with wine, were allowed. Flatus passed by the bowel after the second day; a natural stool followed the use of an enema on the tenth day. In the first days the urine was removed by a Nélaton's catheter; later on, micturition was spontaneous. The wound in the abdomen healed completely by first intention. All the sutures were removed by the tenth day. On November 12 the patient was quite well, having got up on the 10th. Fifteen months after the operation she

was in excellent health in every way. Menstruation returned three months after the operation, and continued to be regular, lasting from three to four days. The microscopical examination of the tumours showed them to be medullary carcinomata; both together weighed between four and five pounds. Schustler says that Madelung is the only other operator who has resected a portion of the intestines in such circumstances. The case is remarkable, seeing that double ovariotomy and resection of portions of the bladder and of the ileum were performed, and yet the patient recovered; further, no recurrence of the tumours had occurred after the lapse of fifteen months.—*Med. Times and Gaz.*, Feb. 24, 1883.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Poisoning by Apomorphia.

Dr. PÉCHOLIER, Professor in the Faculty of Medicine of Montpellier (*Annales d'Hygiène*, August 1882, p. 185), gives an account of his poisoning with this substance. Overworked and enfeebled physically by the milk diet which he had adopted for the preceding three months, Dr. Pécholier began to suffer from a very painful attack of rheumatic sore throat. During seven days he treated himself successively by salicylate of soda in doses somewhat larger than usual (6 grammes at first, and 4 grammes at each of two other doses), by injections of morphia, and by the application of leeches to the neck. Not finding relief, he had recourse to an injection of about 13 milligrammes (¼ grain) of apomorphia. At the end of two minutes he was seized with very severe nausea without vomiting; respiration ceased completely, but returned in an irregular fashion, and left a state of inexpressible anguish. The colleagues of the patient, who were brought in great haste, gave a second dose of apomorphia, which caused vomiting followed by fresh collapse, lasting from thirty to thirty-five minutes, during which time the respiration remained infrequent and stertorous, the pulse feeble and irregular, and the face livid. The application of sinapisms and a subcutaneous injection of sulphuric ether brought the patient out of this condition. In the evening there remained merely traces of the effect, and at the end of four days the angina itself had almost entirely disappeared. As to the cause of this unexpectedly energetic effect of the apomorphia, Dr. Pécholier thinks that the existing anæmia and the other circumstances mentioned above are more to blame than the morphia or the salicylate of soda, although the latter was taken too freely. In his remarks he calls attention to the close connection between the centres for vomiting and respiration in the medulla as explaining very satisfactorily the action of apomorphia on the respiration. In conclusion, he recommends caution in the use of the drug and in the employment of the hypodermic method.—*Edinb. Med. Journ.*, Feb. 1883.

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THE

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